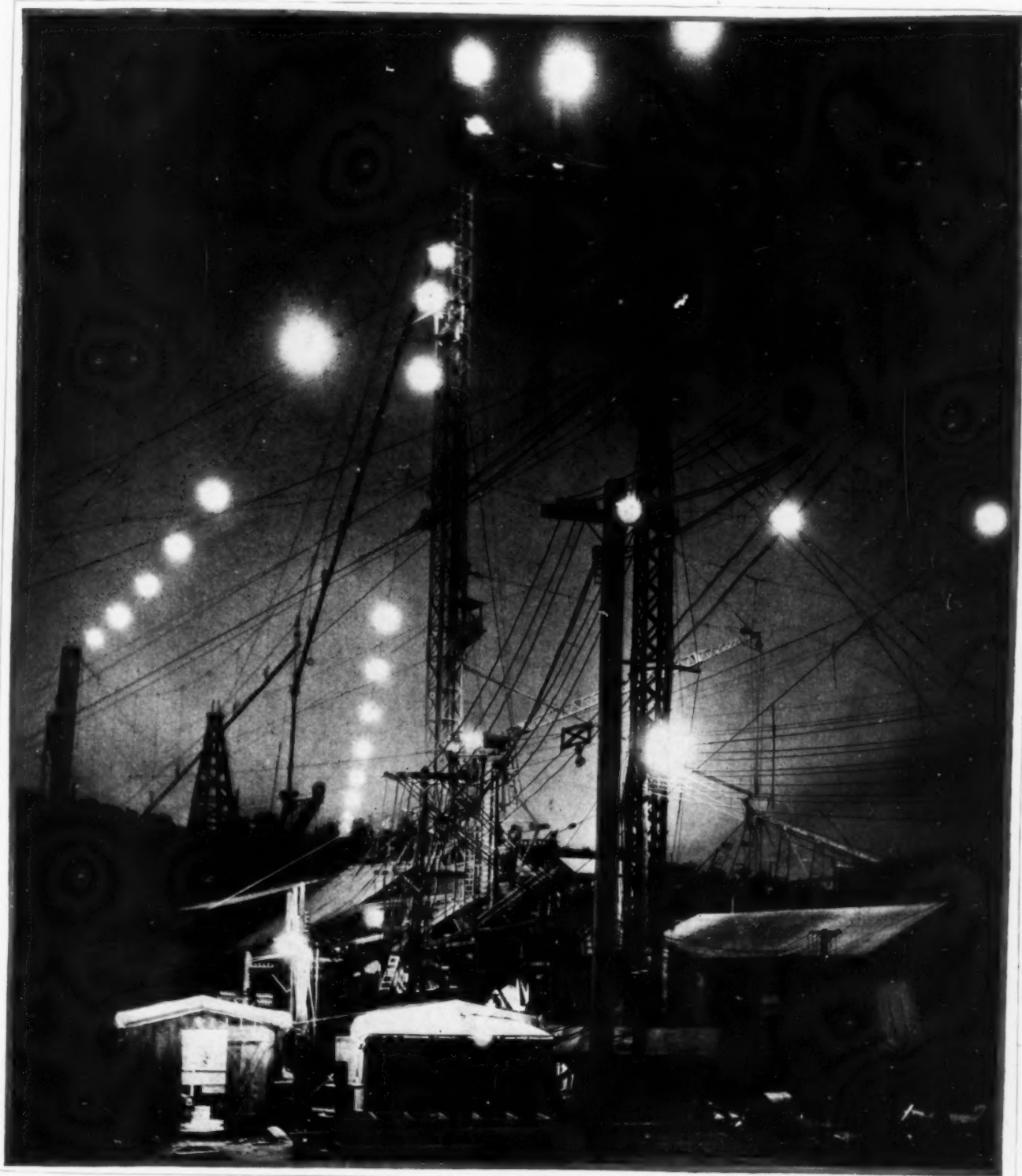


CONSTRUCTION  
JUNE 1927, VOL. 9, NO. 6  
L. Moore.

June  
1927  
RECEIVED  
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Army War College  
D. C.

# Construction Methods

McGraw-Hill Publishing Company, Inc., New York, N. Y.



Night Work on Frog Tanks Dam Near Phoenix, Arizona

A MONTHLY PICTORIAL OF FIELD PRACTICE AND EQUIPMENT

General Construction Highway Buildings Engineering Industrial



Robberson St., Springfield, Mo., was paved with TEXACO Asphalt in 1913.

The booklet or booklets which you need will be sent on request.

1. Texaco Sheet Asphalt.
2. Texaco Asphaltic Concrete.
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4. Texaco Paving Filler (for Brick and Block).
5. Texaco Road Oil and Surfacing Material.
6. Texaco Cold Patch.
7. Resurfacing Worn Macadam and Gravel.
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## 14 years old

A pavement has the greatest chance of passing the 14-year-old mark if it is *resilient*.

Beneath the knocks and the blows of traffic, the *resilient* pavement yields, then resumes its original position. Just like rubber.

TEXACO Asphalt pavements are *resilient*. Their durability and low maintenance cost are being demonstrated in more than 1300 U. S. cities today.

# TEXACO



New York  
Philadelphia  
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**The Texas Company**  
ASPHALT SALES DEPT.  
17 Battery Place, New York City

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# Construction Methods

## Hitting the High Spots

ONCE upon a time we could have described this issue very simply. That little word "wet" would have told every one that it is full of water from cover to cover—reservoirs, aqueducts, dams, rivers and other damp spots. In this day and age,



however, we probably will have to call it "dry" in order to denote the presence of water.

But wet or dry, the reason therefor is the meeting of the American Water-Works Association in Chicago this month. The gentlemen who provide us with water form one of the biggest and most progressive units in the great construction industry.

THE first glimpse of water is on page 3 where the good old Rhine is introduced in order to show a life size model of a bridge that the Germans



are putting up so that they can be sure they like its looks before they begin fooling with concrete and steel. It looks like a good idea.

Then there is a ninety-mile aqueduct that the East Bay cities are building in California, pages 16-18; some standpipe that Cincinnati is putting up on the highest hill in the neighborhood, page 19 (we really do hit a high spot now and then); a big dam in Arizona, pages 24-27; some improvements in the water supply of Fort Collins, Colorado, pages 28-29. You

can find water oozing out of some other pages if you look hard enough, particularly on page 13 where a handsome motor truck is being rescued from a watery grave.

THERE are plenty of dry spots, too. The Blue Book, for instance, pages 9-12 as usual. It really should be called the "Blue Streak" this month, for it shows lightning-like progress being made on a big building in Los Angeles. Sears, Roebuck & Co. wanted it in a hurry and the Scofield



Engineering-Construction Co. took the job. Work began on January 1, 1927, and now look at the darn thing. It will be ready July 1, one month ahead of schedule.

SAFETY is so important a factor in construction and one so often neglected that every man in the industry needs to keep it in mind. The pictures on pages 30-33 may help a bit.

And don't forget the advertisements. They get better every month. One advantage of a pictorial magazine is that there is no sharp line between edi-



torial and advertising pages. They all are full of pictures and they all tell the same story—progress in the construction industry.



Strength Obtained on Typical Jobs Thru Use of High-Early-Strength Concrete made according to thoroly tested methods with standard—not special—Universal cement.				
Location	Type of Job	Date Placed	Compressive Strength Pounds Per Square Inch	
La Grange Park, Ill.	Street Intersection	July, 1926	3 days—2360	7 days—3600
Duluth, Minn.	Business Thorofare	Sept., 1926	4 days—2130	6 days—2950
Chicago, Ill.	Loading Platform	Sept., 1926	3½ days—4070	No further tests
Wheeling, W. Va.	Street	August, 1926	3 days—2245	7 days—3130
Columbus, Ohio	Reinforced Deck Slab	October, 1926	2 days—2550 3 days—3120	No further tests
Ordinary Concrete has a Compressive Strength of about 2000 lbs. per square inch at 28 days.				

The results shown above were obtained not in the laboratory but in the field on the jobs indicated. The standard Universal cement used in all of above jobs was of the same uniform quality. Difference in strengths is due to variations in proportioning, mixing, placing and curing of the concrete. As strength of this concrete increases with age, the user not only gets high earlier strength but at the same time a higher ultimate strength that makes it stronger and better concrete forever after. For further information, use the coupon.

UNIVERSAL PORTLAND CEMENT CO.  
210 South La Salle Street, Chicago

Without obligation, please send me detailed information on methods for securing strong concrete in 3 days with standard—not special—Universal cement, the same quality Universal regularly used.

Name .....

Address .....

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*When time is money*  
use High-Early-Strength concrete  
made with standard (not special)  
Universal Cement

## Actual Construction Records Show Success of High-Early-Strength Universal Concrete

Here are results obtained with High-Early-Strength Universal Concrete on actual construction work.

These show the value of using fully tested methods and standard—not special—Universal cement to obtain High-Early-Strength concrete.

As such concrete also has a higher ultimate strength, it is permanently better and stronger concrete.

The accompanying coupon will bring full details promptly.

## Universal Portland Cement Co.

Chicago Pittsburgh Minneapolis Duluth Cleveland Columbus New York

Concrete for Permanence





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# Construction Methods

McGraw-Hill  
Publishing Company, Inc.  
JAMES H. MCGRAW, President  
E. J. MEHRN, Vice-President

*A Monthly Pictorial of Field Practice and Equipment Illustrating Successful Construction, Maintenance and Material-Handling Methods for General Construction, Highways, Buildings, Industrial Plants and Public Works and Utilities*

WILLIAM JABINE  
Editor

VOLUME 9

NEW YORK, JUNE, 1927

NUMBER 6

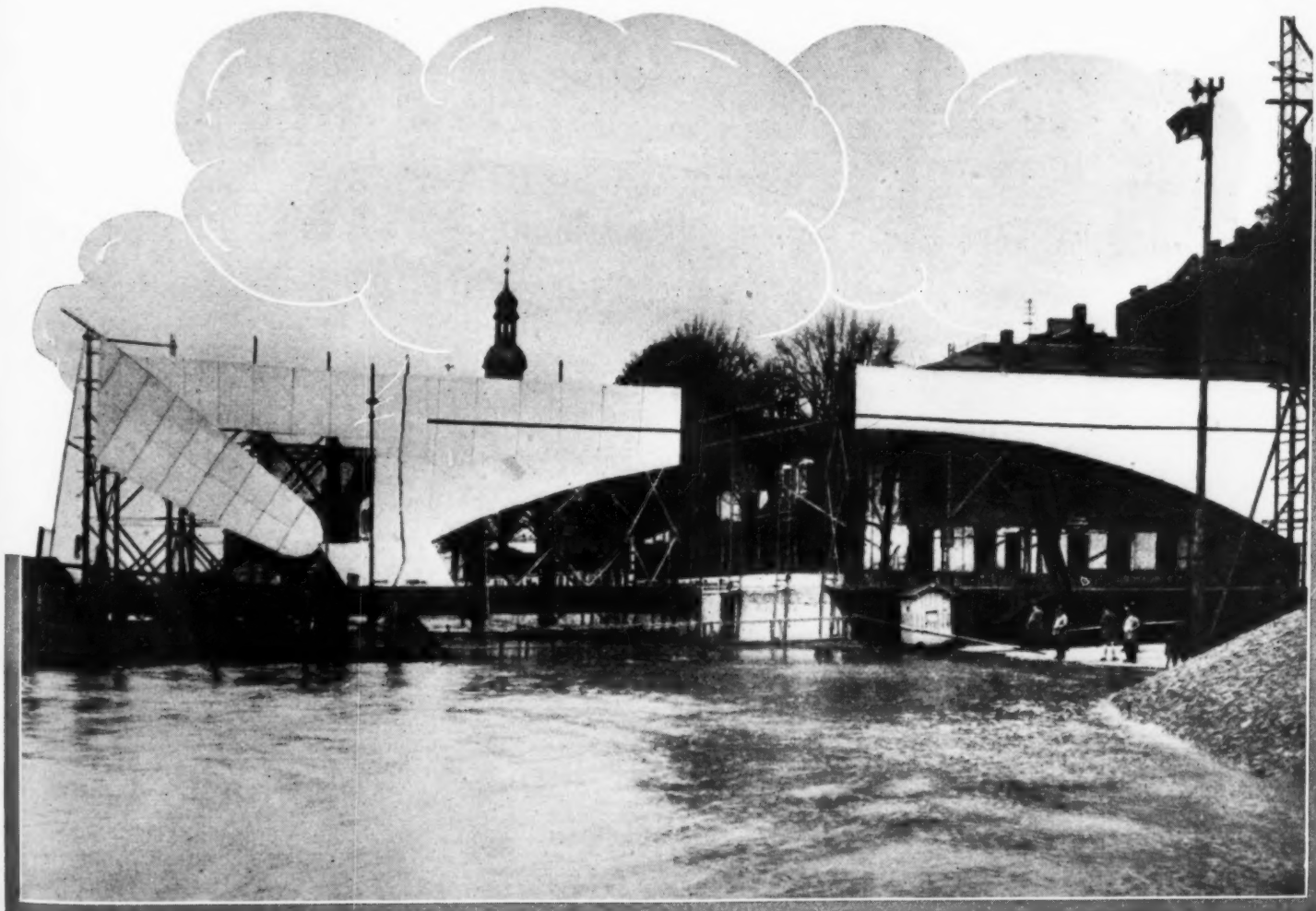
## Building Bridges on the Rhine

THERE are various ways of trying to determine how a structure will look when completed, and many of them have a history that is full of disappointment. The architect's or designer's pictures are very pleasing to the eye, but somehow or other when they get translated into steel or concrete they lose some of their beauty.

The Germans are building a new bridge across the Rhine from Cologne to Mülheim, and in order to find out just how the new structure will look when completed, a full size

dummy made of canvas stretched on wood frames has been put up. This scheme makes it possible to change the appearance of the new bridge before the design is completed and to make any alterations in the design at a time when alterations consist simply in erasing a few lines.

The use of models for construction purposes is constantly increasing in this country, but a full size model of a big bridge has all the earmarks of a brand new idea. If it is successful in Germany, perhaps it will be tried here.

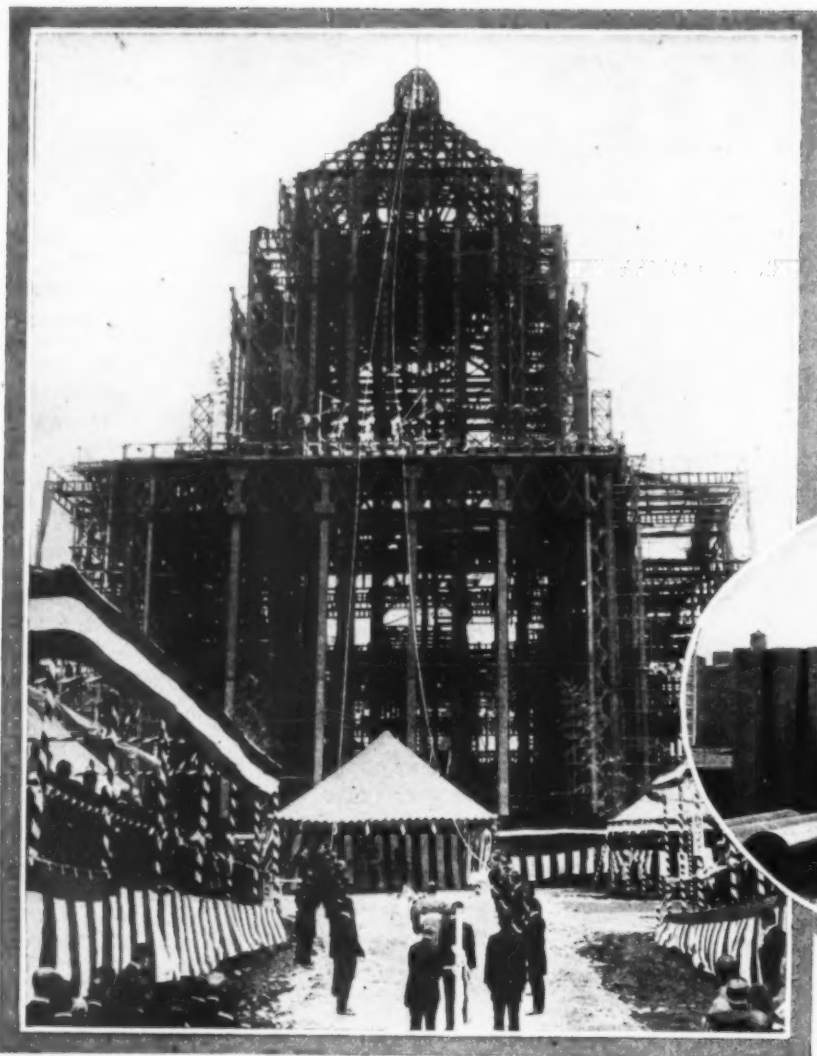


© Underwood & Underwood.

CONSTRUCTION METHODS—June, 1927

Page Three

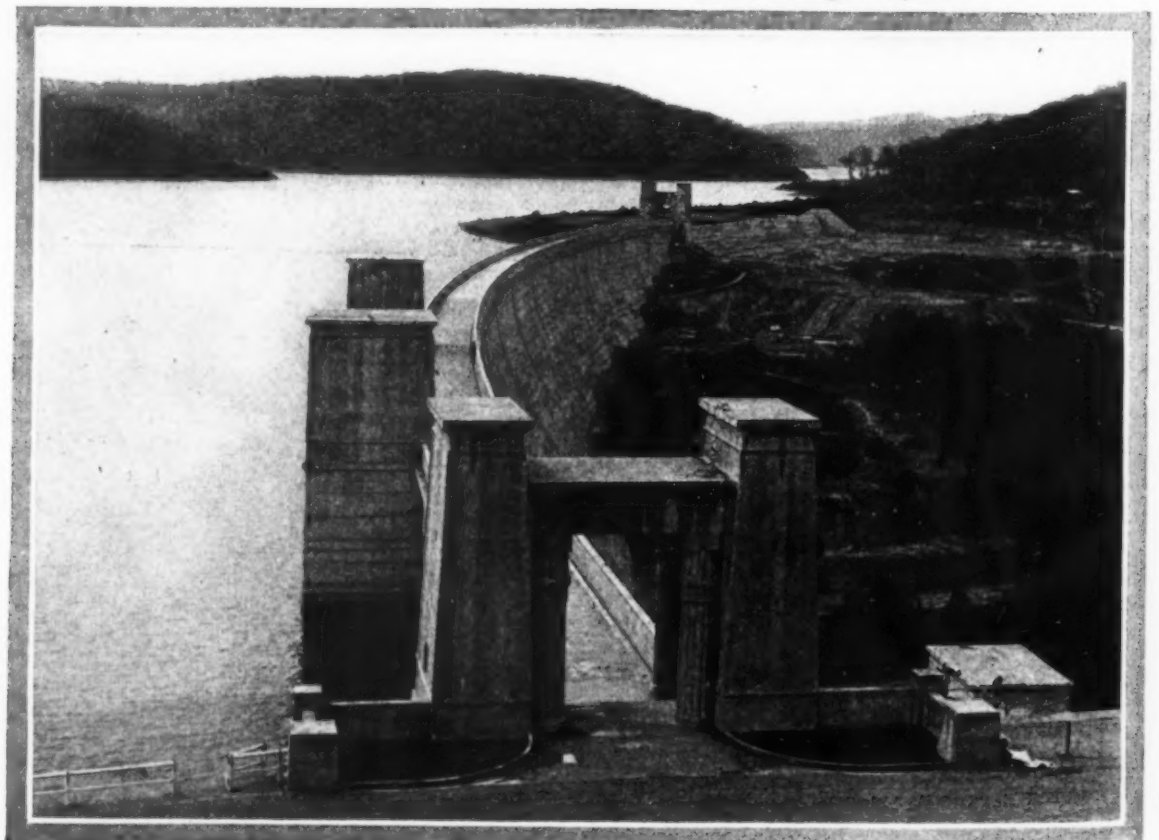
# Water, Every



© P. & A.

Above — Elaborate ceremonies marked the dedication of Japan's new House of Parliament in Tokyo

At right—Sydney in far-off Australia gets its water from the supply impounded by the Cordeaux Dam



© International.

Above—New York's Board of Water Supply is using these 30-ft. lengths of pipe, each weighing 6½ tons, in the Village of Queens



At left—This queer looking concrete water tank is 100 ft. above the ground. It is in Georgia



# Water where

This handsome water tower serves a Detroit suburb. It also is a lighthouse

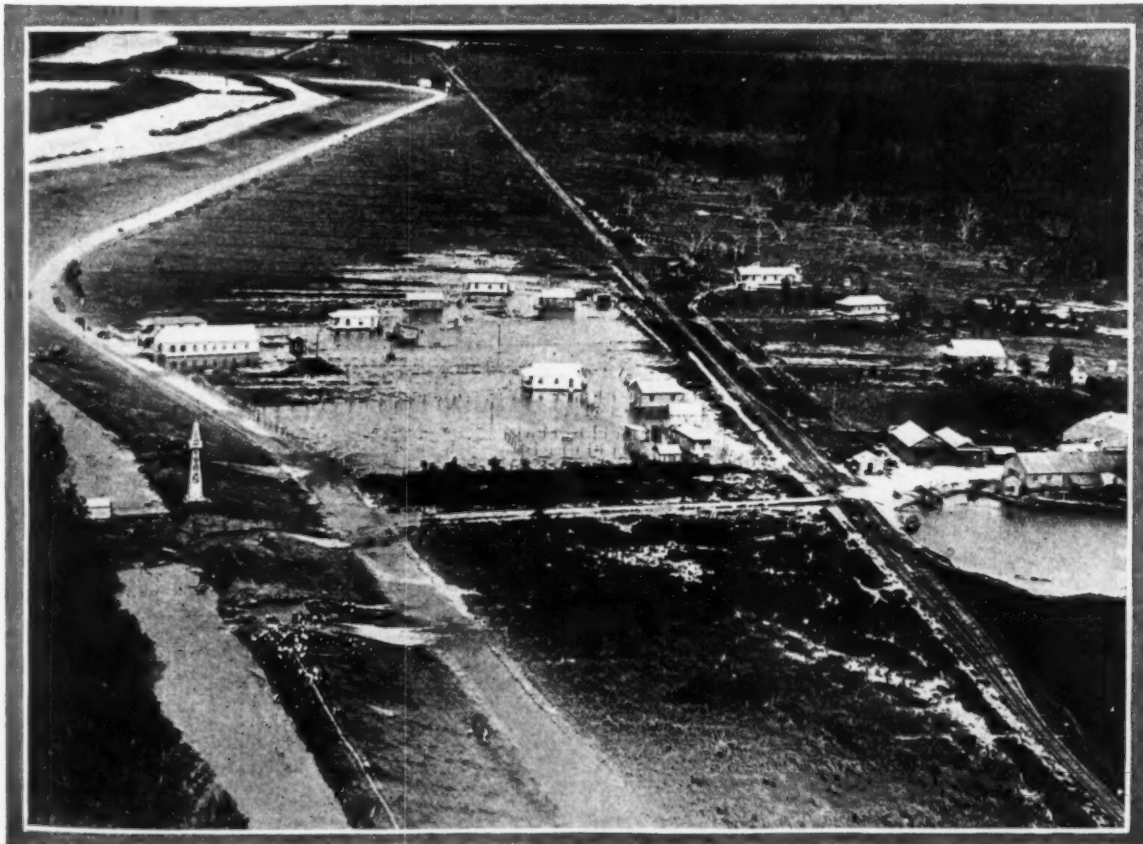


Above—A mixture of men and machines reconstructing water mains in Havana, Cuba. The truck-mounted mixer is a Rex



© P. & A.

Above—Night work was necessary to complete the new stand in time for the English Derby



At left—Just after the levee had been dynamited at Poydras below New Orleans. The water is making its way through the breaks

# Heavy Road Work in Pennsylvania

## Various Methods Used in Cutting Highway Through Rocky Hillsides in Susquehanna Valley

**C**LOSE to the geographical center of Pennsylvania where the west branch of the Susquehanna makes its way through the Alleghenies, the State Highway Department is building about 30 miles of highway which involves some of the heaviest road work going on at the present time anywhere in the United States. In this 30 miles about 1,000,000 yd. of material are being moved and the greater proportion of this material is rock.

The job has been let in three contracts. The first, from Lock Haven to Hyner 19.8 mi. in length was awarded to William C. Horn of Athens, Pa.; the second, about a mile long just out of Renovo, to the Mill Iron Construction Co. of Pittsburgh, and the third, a 10-mi. stretch between Renovo and Keating, to the Miller Construction Co. of Punxsutawny. These three contractors are using various methods of doing their work, the main reliance, of course, being placed on power shovels.

A good idea of the conditions on the Miller job is afforded by the pictures at the bottom of this page. At this point a big Koehring 7-yd. gas shovel is cutting a bench on the hillside high above the Susquehanna River. The material

is being carried away in small Western dump cars hauled by a steam engine. It is being dumped on a fill which will carry the new road over a low spot. In addition to this outfit, the Miller Co. is handling other sections of its job with an Erie steam shovel and trucks, and a Bucyrus 2½-yd. shovel served by industrial railway. Frequent blasting is necessary, and great care has to be taken to protect the tracks of the Pennsylvania railroad which are immediately below on the bank of the river. A gang of men has to be kept down on the tracks clearing away debris that is dislodged by the shovel.

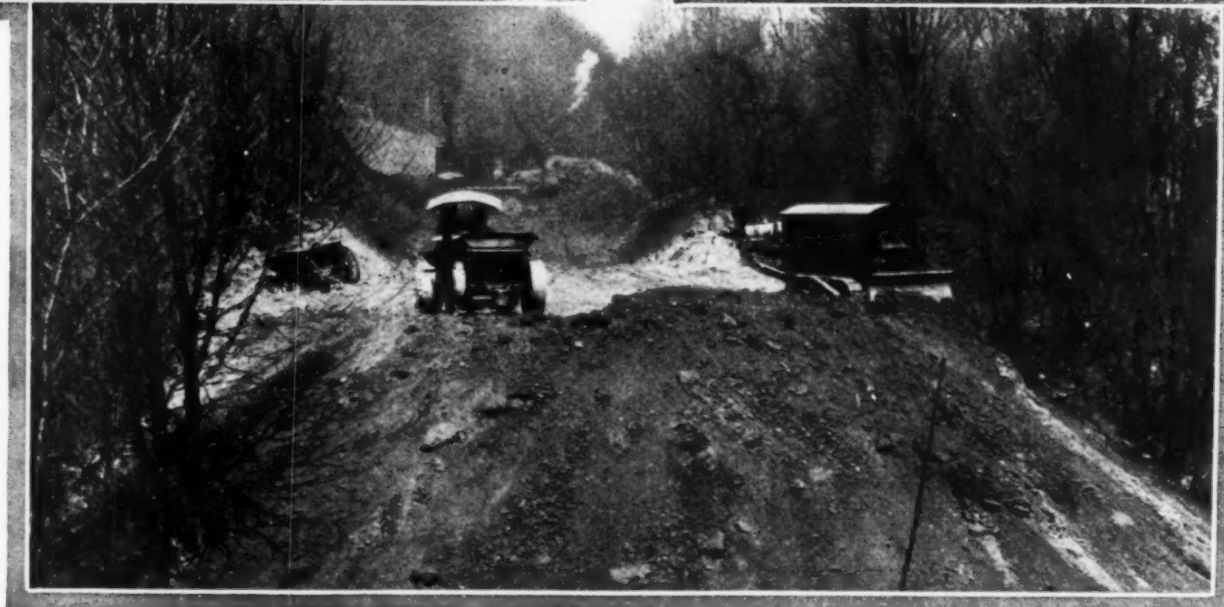
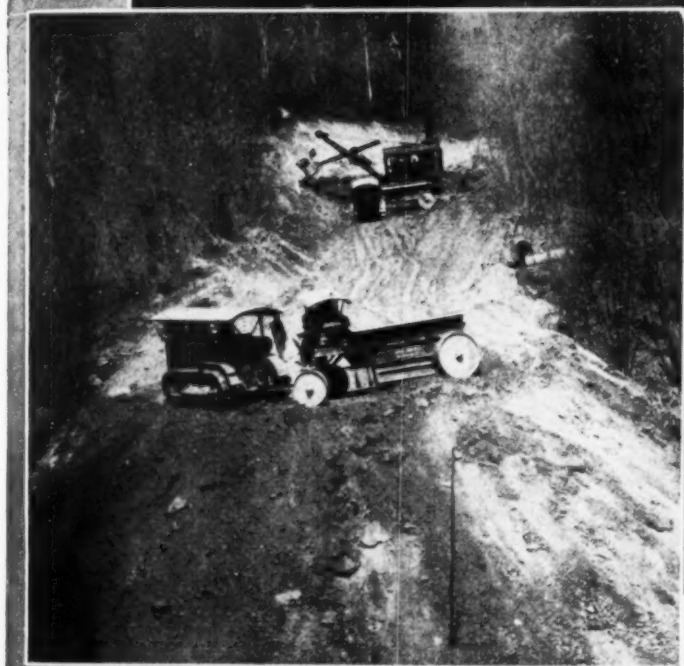
The smoothest working part of the Horn job is shown in the group of photographs on the opposite page. An outfit consisting of two 6-ton Caterpillar tractors hauling LaPlant-Choate wagons, a 3-ton Caterpillar equipped with a bulldozer, and an Erie steam shovel are transferring material from a cut to a fill.

A good idea of the heavy going may be obtained from the pictures on page 8. The upper two were taken on the Horn job and show Gas + Air Eries picking their way through the loose rock. The picture at the bottom of the

Carrying the road around the shoulder of a hill high up above the Susquehanna. The fill where the rock is dumped is about ¼ mi. from the shovel







This smooth working outfit is moving dirt at a remarkable pace. The top picture shows one wagon being loaded at the shovel, another being hauled by a tractor down to the edge of the fill while the bulldozer waits. The two center photographs show how close to the edge the tractors and

wagons go as they dump their load, and the lower picture shows a tractor and wagon returning to the shovel just after dumping its load, while the bulldozer has quickly moved into position and is pushing the dirt over the edge of the slope to make a necessary fill.



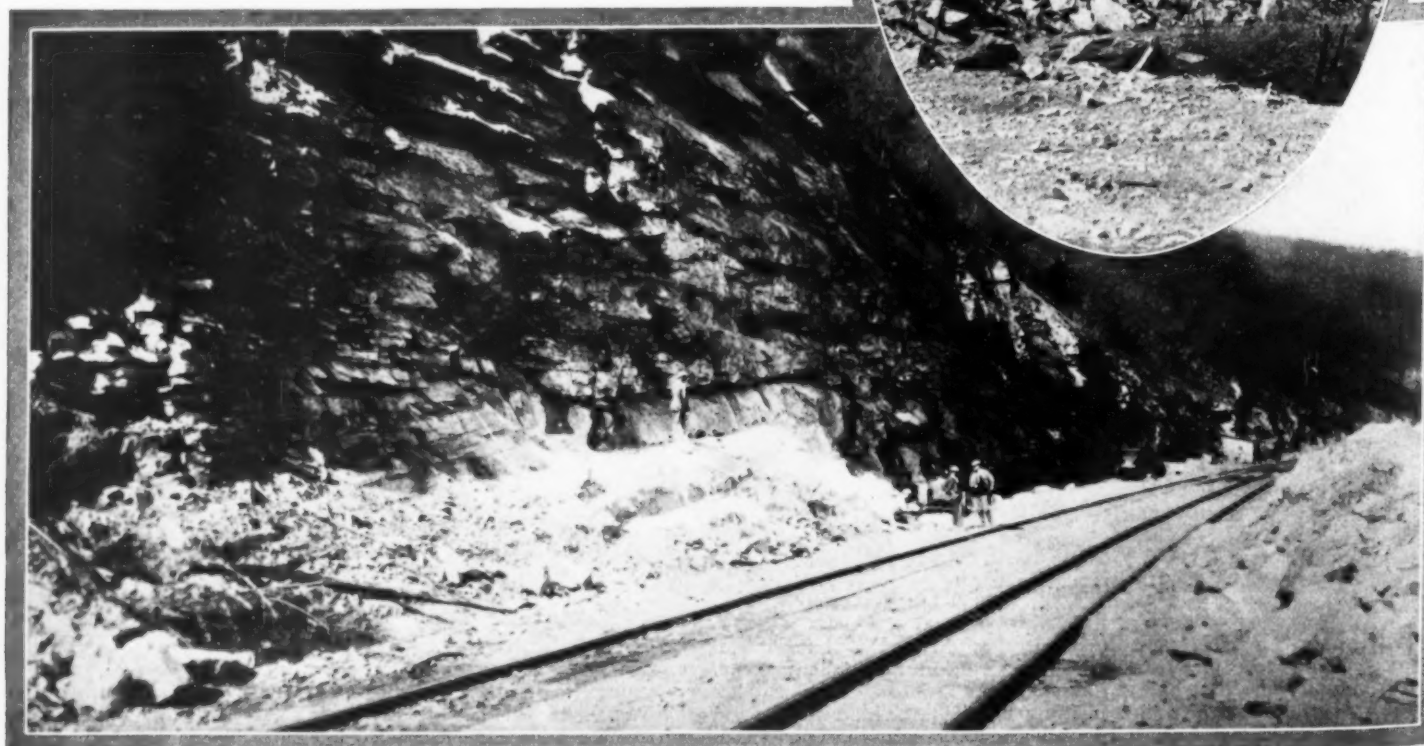


Above—Rocks too big and heavy to get into the bucket are pushed over the hillside

At right—The steam shovel moves away while the men drill for a blast

page shows the Mill Iron Company's job. At this point the railroad tracks are to be moved nearer to the river, and the new road is to go through between the tracks and the almost perpendicular wall of rock. Ingersoll-Rand air drills are doing a good share of this work. An Erie shovel is picking up the rock after it has been blasted and loads it into trucks.

Below—At this point the road is being carved out of solid rock





# BLUE BOOK



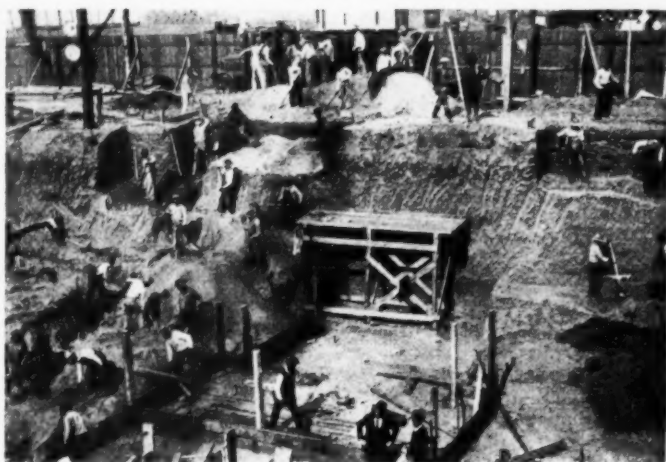
## Building for Sears, Roebuck & Co. in Los Angeles

The great building which will handle both the retail and mail order business of Sears, Roebuck & Co. is being rushed to completion in Los Angeles by the Scofield Engineering-Construction Co. of that city. The contract

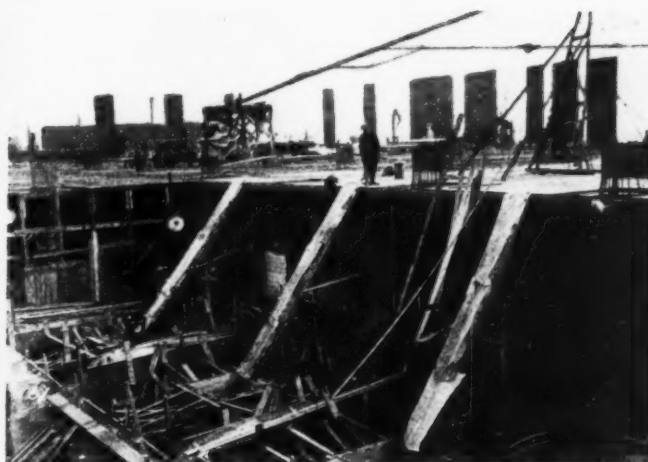
was awarded on Christmas Eve last and Sears, Roebuck & Co. will move in about July 1. The structure is 9 stories in height, 360 ft. long and 160 ft. wide with a tower extending 70 ft. above the roof.



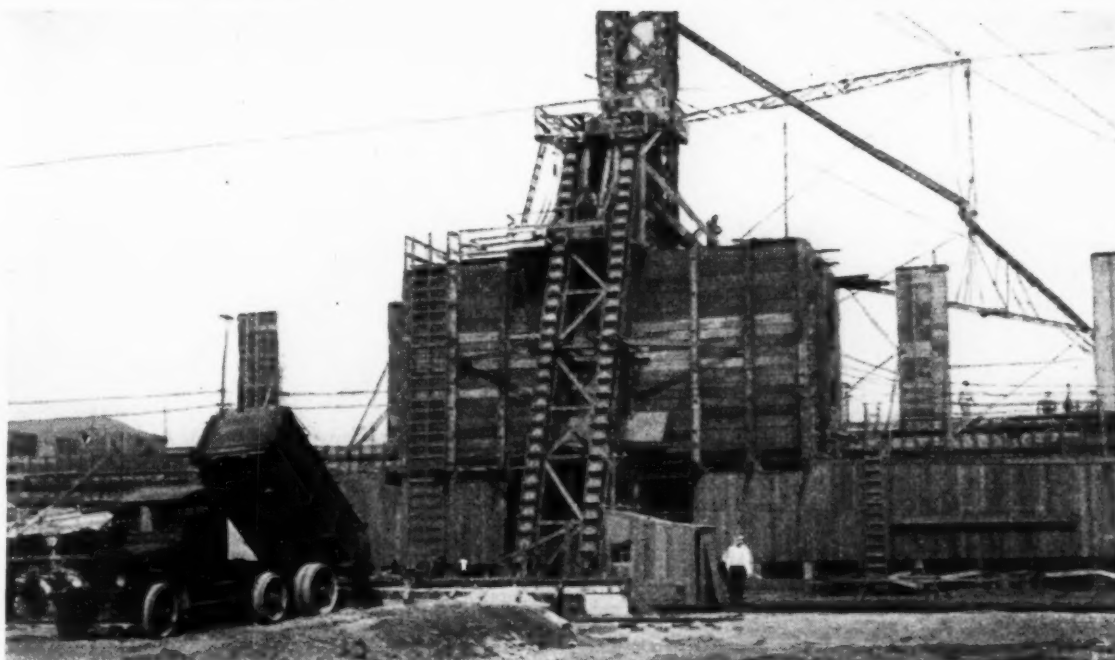
Five Erie shovels began digging in on December 28 last



In order to make speed and because the plans were not ready, one of the tower footings had to be excavated by hand



Preparing to pour the smaller tower footings. By this time the plans were in such shape that modern construction machinery was in use



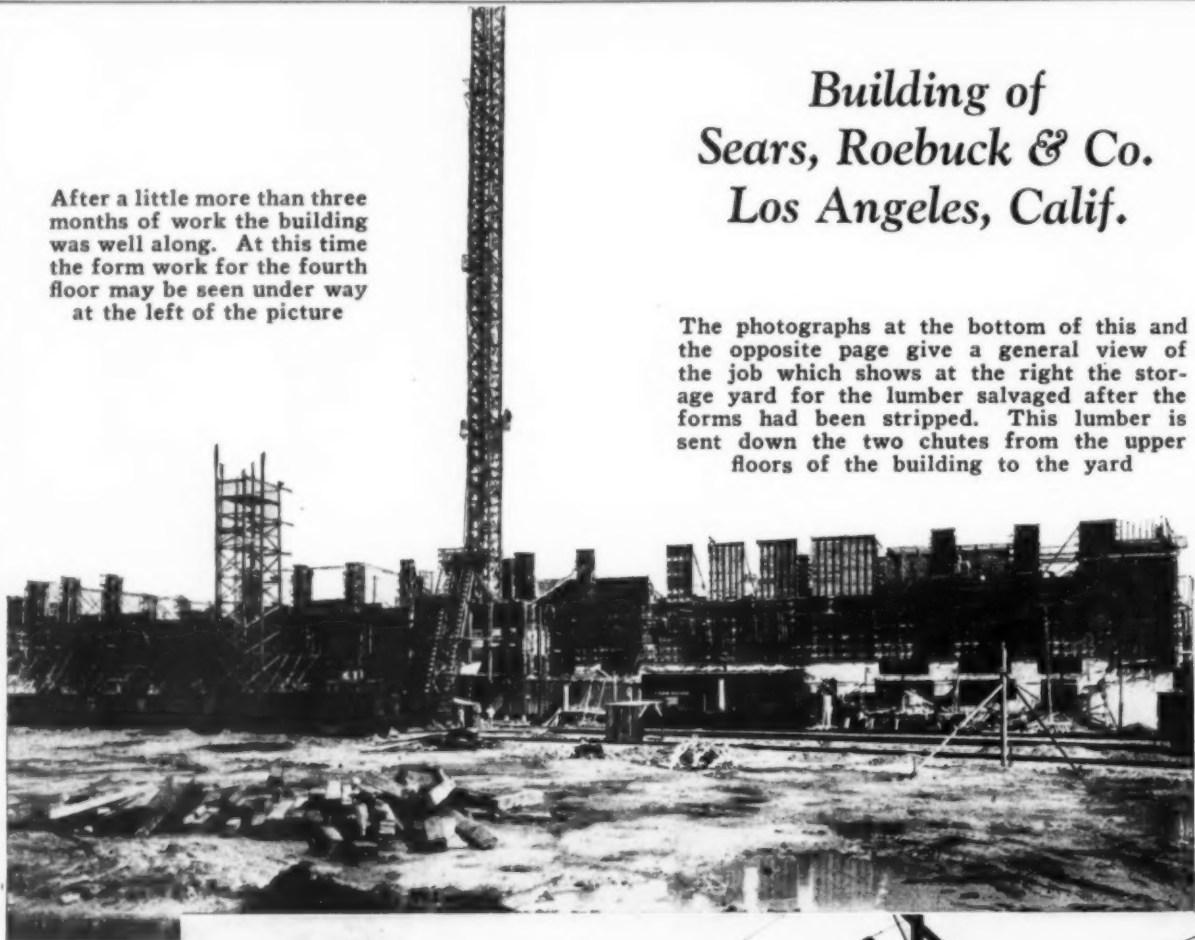
Track hoppers serve the mixing plant but before they were completed the plant was put into operation by backing in trucks which dumped into the track hoppers



## Building of Sears, Roebuck & Co. Los Angeles, Calif.

After a little more than three months of work the building was well along. At this time the form work for the fourth floor may be seen under way at the left of the picture

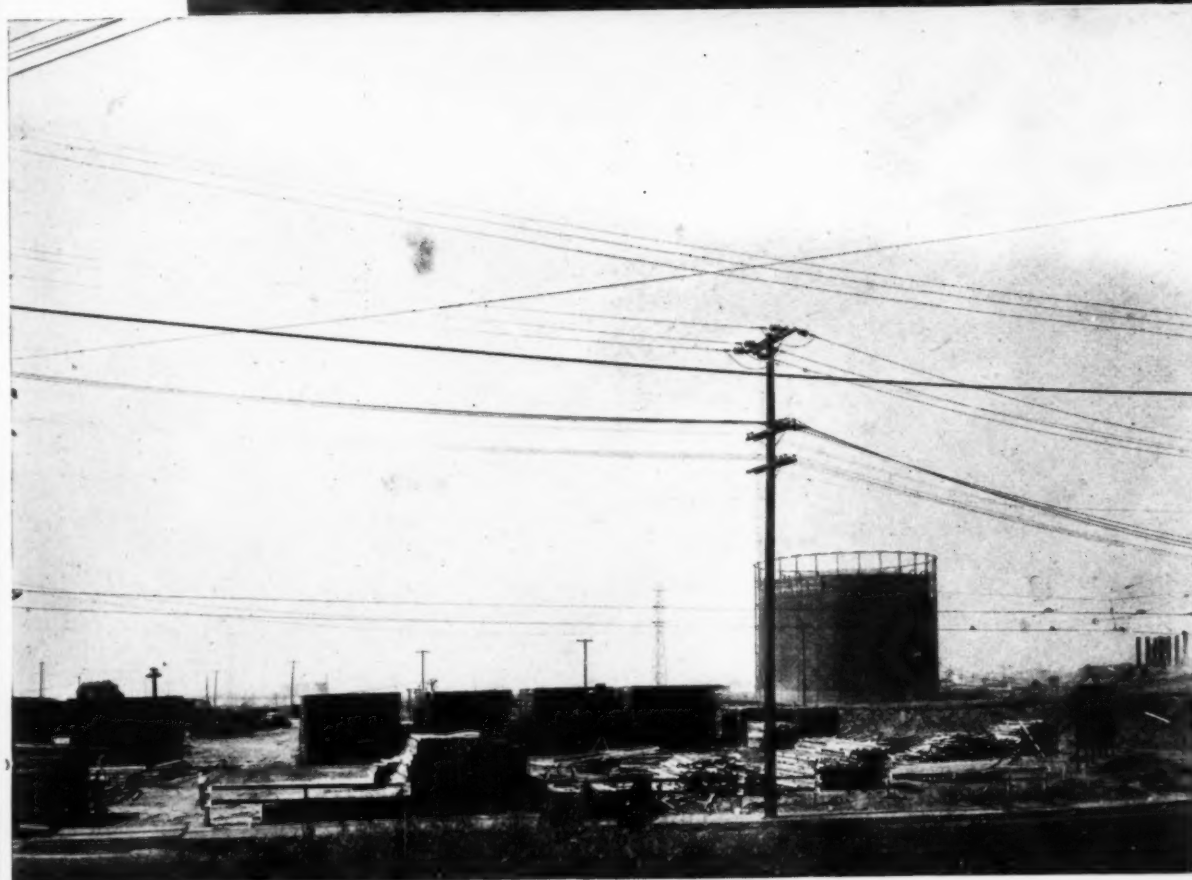
The photographs at the bottom of this and the opposite page give a general view of the job which shows at the right the storage yard for the lumber salvaged after the forms had been stripped. This lumber is sent down the two chutes from the upper floors of the building to the yard





## Building of Sears, Roebuck & Co. Los Angeles, Calif.

By May 2 when this picture was taken all of the concrete had been poured. At this time the material hoist at the face of the tower had just handled the last of the lumber for the forms



"When will it be finished?" **BLUE BOOK** "Why it is finished!"

*Sears, Roebuck & Co.*

*Los Angeles, Calif.*

At right—The west end of the building from the lumber yard as the structure was nearing completion. As many as 35 carloads of material were handled in one day, and the average was 30 cars per day

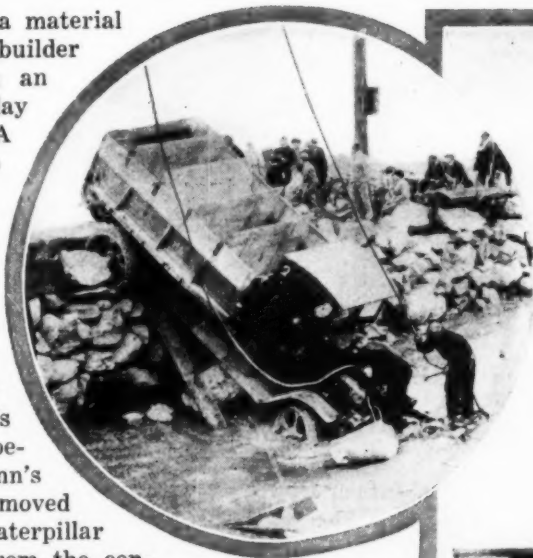


Below—Six lines of railroad track bring in the materials used in the big structure. The architect's drawing in the center shows the building as it will appear when completed



# The Rescue Squad Goes Into Action

A ROAD contractor, a material man and a boat builder joined hands in an emergency the other day at Mamaroneck, N. Y. A truck, which had come to the material yard of F. A. Ottmann & Son for a load of sand and gravel, slipped over the edge of the road while maneuvering and plunged into the water a few feet below, landing in a corner of Haviland's boatyard. Rescue work began at once. Ottmann's Northwest crane was moved across the road, a Caterpillar tractor was borrowed from the contractor working on the Boston Post Road nearby, and Haviland's men pulled on their heavy boots and waded over to the truck. The tractor first attached a cable to the rear of the truck, and the men in the water fastened lines to the front. With the tractor pulling straight back and the crane lifting the heavy truck, it was pulled out of the water and set down on dry land in 15 min.





# Cameras Win Prizes for T



**James B. Hays**

*Division Engineer, Tallassee Power Co.,*

**Calderwood, Tennessee**

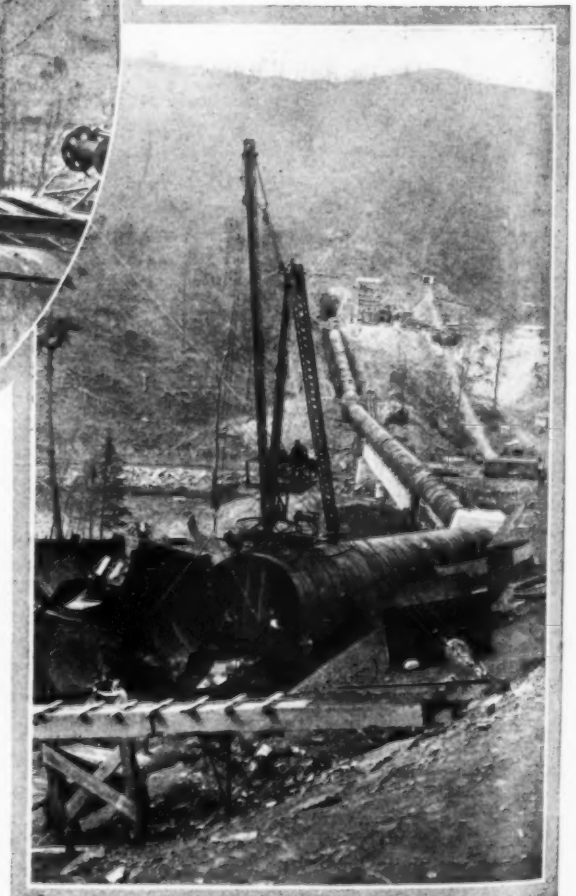
*Wins First Prize of \$25.00*

THESE three photographs showing the method of erecting a steel penstock 11 ft. in diameter in North Carolina win the first prize in the June contest. James B. Hays, who took them, is a division engineer for the Tallassee Power Co., and the work is being done by the Chicago Bridge & Iron Works in Graham County. The penstock is being set up by a traveller which moves along the top of the pipe for a distance of 30 ft. each time it is fastened, a hand crab pulling it along. The swing is operated by a winch, and two small air hoists operate the boom and fall lines. One stiff-leg in the rear is bolted to the pipe and is adjustable so that the pipe may be built either on the level or upgrade.

IS YOUR CAMERA  
A Money Maker?

ANOTHER chance to earn money by pressing the button of your camera is offered by *Construction Methods* for the month of July. We want pictures that will show how you are handling your job and which will give your fellow construction men useful hints in regard to their own work. Don't forget that three prizes are awarded each month and that everybody has a chance. As usual, first prize is \$25.00 for the picture best suited to the needs of *Construction Methods*, the second prize is \$15.00, and the third prize is \$10.00.

The conditions remain as before. The photographs must be taken by a man actually employed on the job and should be sent to *Construction Methods*, Tenth Avenue at Thirty-sixth Street, New York City, by Friday, June 10, and plainly marked Photographic Contest. Photographs received after that date will be entered in the August contest. *Construction Methods* will pay for all non-prize-winning photographs which it uses.



# or Three More Builders

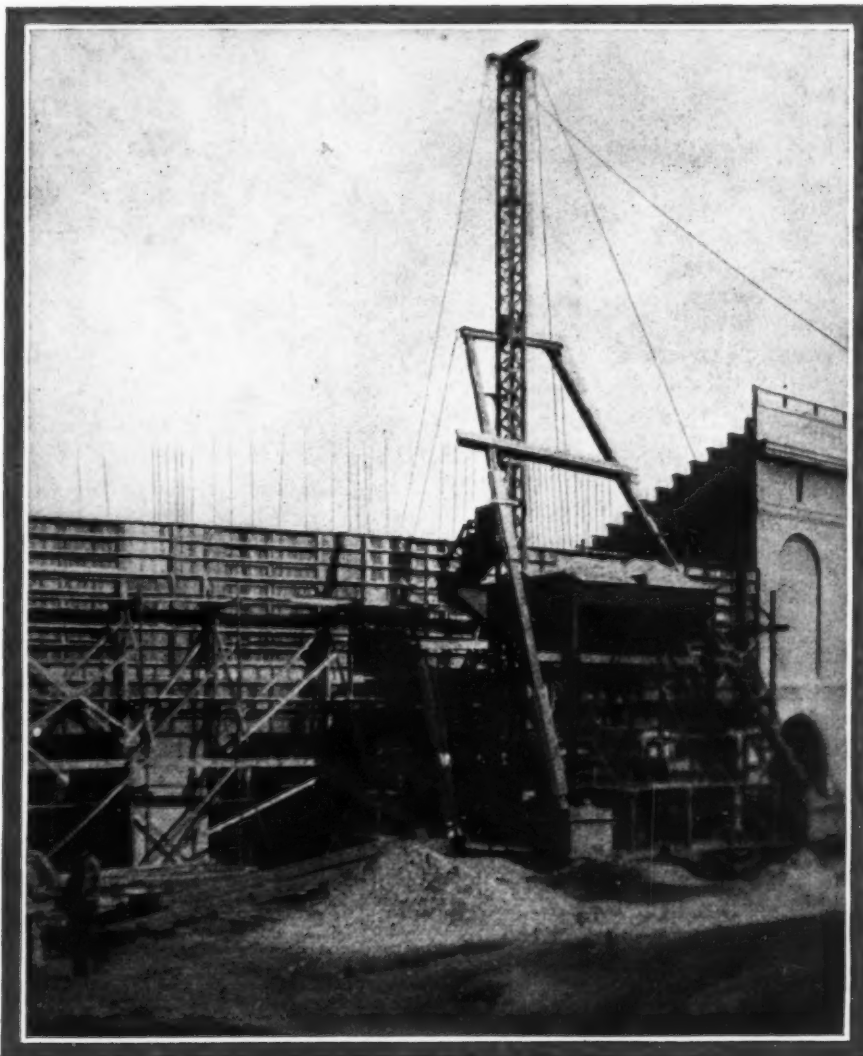
## J. W. Goldsborough

*Carpenter Foreman, Carrothers & Forsythe,*

### Lawrence, Kansas

*Wins Second Prize of \$15.00*

**T**HE second prize goes to Lawrence, Kan. This picture was sent in by J. W. Goldsborough, carpenter foreman on the construction of an addition to the Kansas Memorial Stadium in that city. The picture shows the portable Insley mast and automatic weighing hoppers which are used in pouring the concrete. This outfit is moved along behind the stadium making it as easy to pour one section as another. The contractors for the work are Carrothers & Forsythe of Kansas City. The superintendent is W. Kay of St. Joseph, Mo. Art Connet of Lawrence is the concrete foreman.



## H. C. Link

*Assistant to General Superintendent  
The Foundation Co. of Canada, Ltd.,*

### Maniwaki, Quebec

*Wins Third Prize of \$10.00*

**T**HE third prize goes all the way to Canada for a picture taken on the construction of the Maniwaki Dam in Quebec, which is being handled by the Foundation Co. of Canada, Ltd. The picture shows two Linn tractors hauling a steel boat hull which is 65 ft. in length and weighs 35 tons. This boat was hauled 35 mi. through the woods and over the snow.





# Long Aqueduct Will Bring Water

East Bay Municipalities Join in Constructing Line—Electric Welded

**A**N aqueduct 90 miles in length is being built between Oakland, Calif., and nearby cities which have joined in what is known as the East Bay Municipal Utility District, which also plans to build the Lancha Plana Reservoir on the Mokelumne River. Construction of the 45-mi. section between Old River and San Pablo Creek just outside the District has been rushed in order to make available the flood waters of the San Joaquin River in the event of water shortage this spring.

The contracts of Twohy Bros. Co., San Francisco, Calif., and J. F. Shea, Portland, Ore., include about 83 miles of electric welded steel pipe in 30-ft. sections, varying in diameter from 58 in. to 65 in. and in thickness from  $\frac{3}{8}$  in. to  $\frac{1}{2}$  in. The steel pipe is being welded by the Steel Tank and Pipe Co. of Berkeley, Calif. Joints are being riveted for most of the distance. But in one section, a mile in length, where there is a 63-in. pumping line and a 65-in. surge line side by side, the joints



A typical section of the Lafayette tunnel

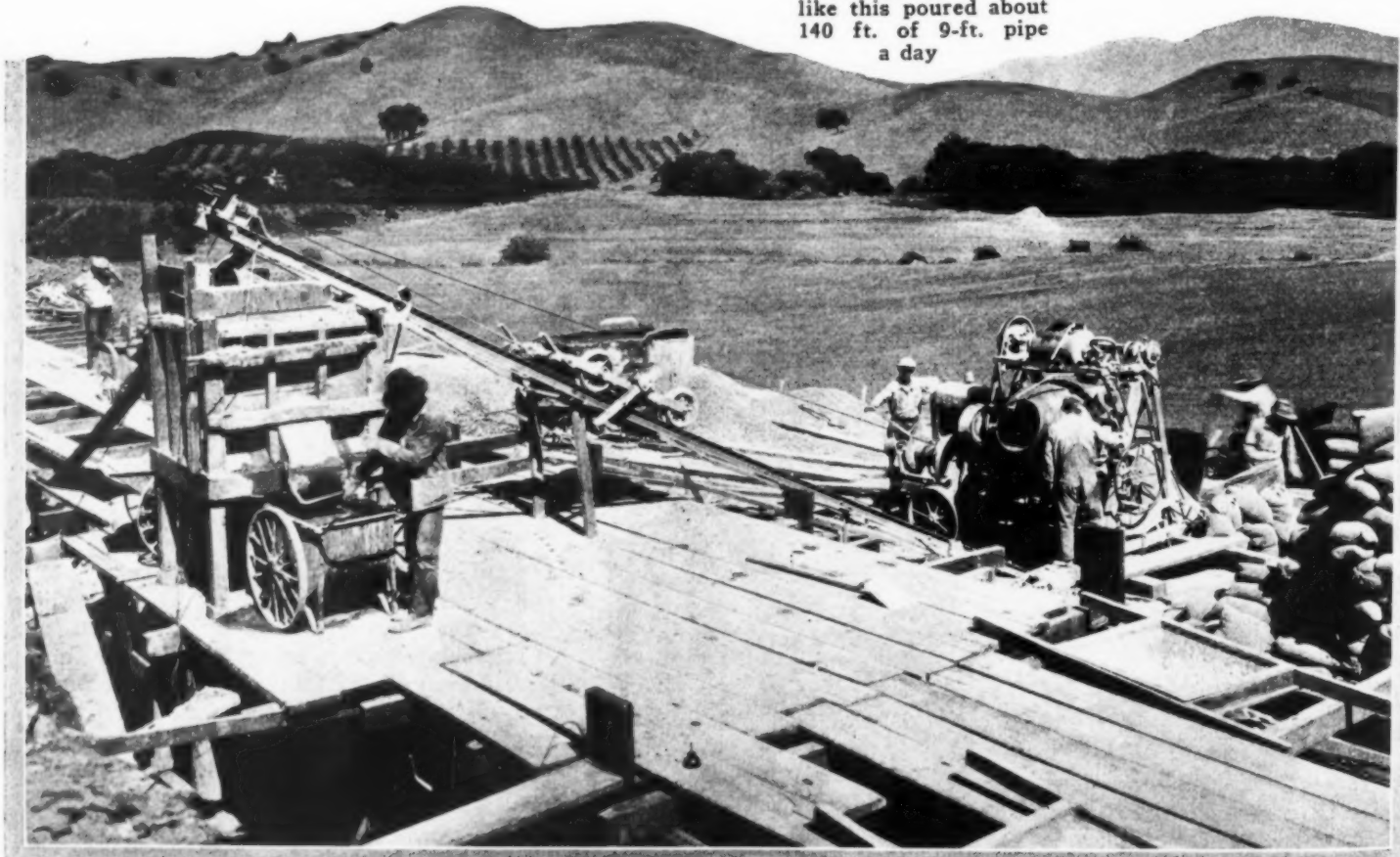
are being electric welded. Bell and spigot joints are used on grade, and butt strap joints at changes in grade. The adoption of welded pipe on this project has saved the District several million dollars.

One of the tools which deserves special mention on this job is the 6,000-lb. clamshell bucket shown in one of the photographs being operated by a Northwest crane. This bucket has a spread of approximately 12 ft., and it digs the bell holes to full width, reducing the labor of this operation to a negligible amount.

The Lafayette Tunnel part of the same project is being built by Smith Bros., Inc., of Dallas, Tex. The tunnel has an 8x8-ft. horseshoe section and is 14,800 ft. long. The lining is 12 in. thick in the timbered sections. The tunnel is timbered with sets spaced on 3 to 5-ft. centers.

All work is being done under the supervision of Arthur P. Davis, chief engineer and general manager of the East Bay Municipal Utility District. James Munn is construc-

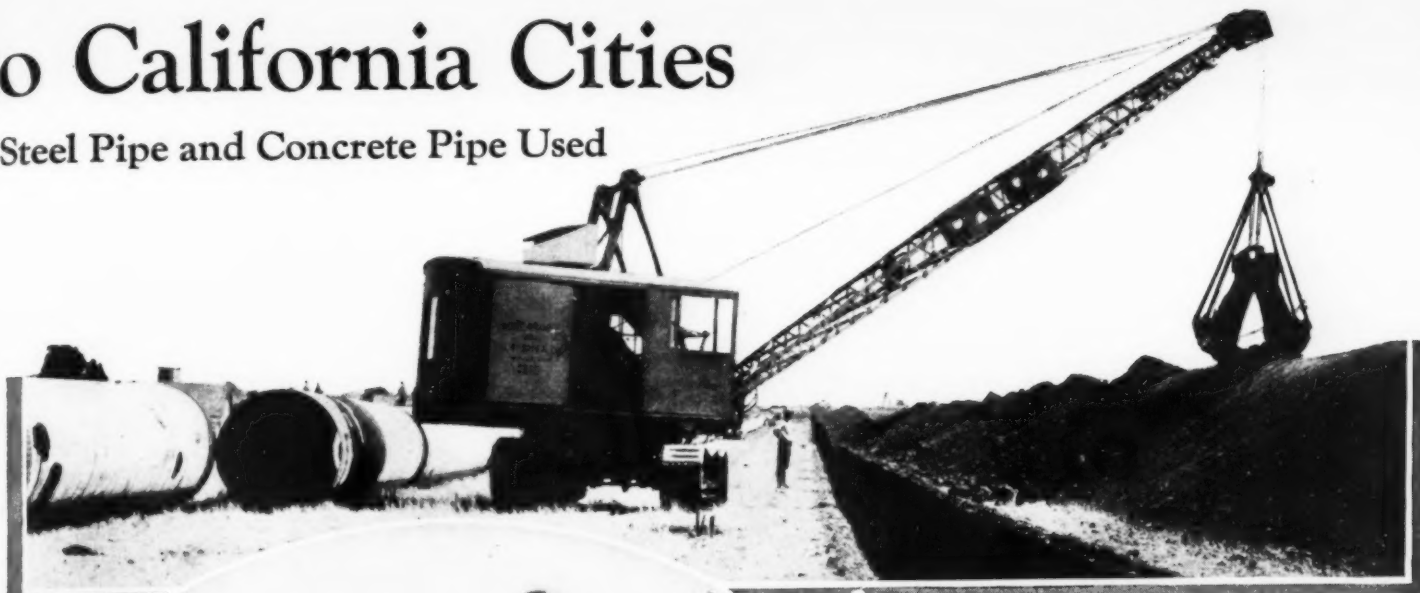
Three Jaeger outfits like this poured about 140 ft. of 9-ft. pipe a day



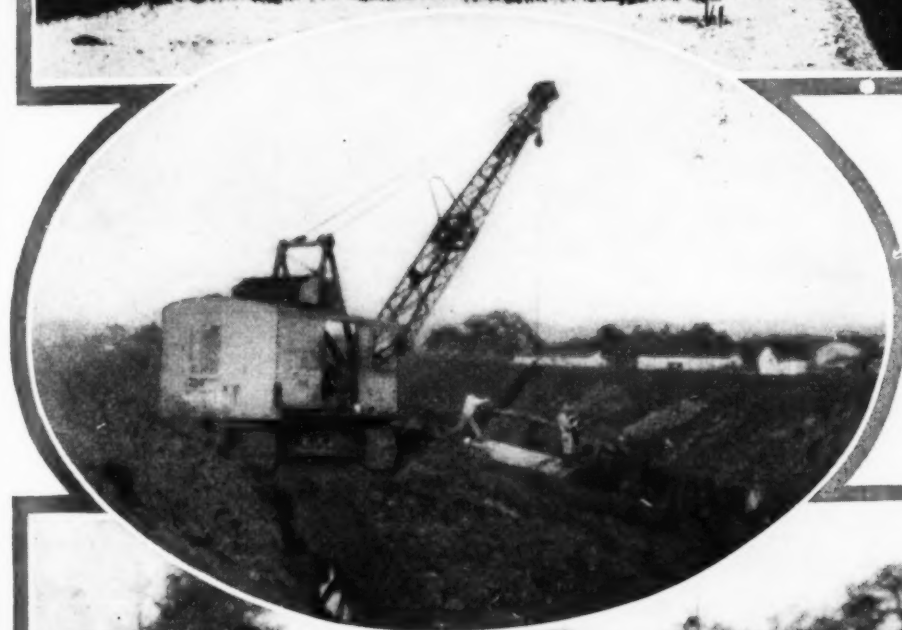


# r to California Cities

Steel Pipe and Concrete Pipe Used



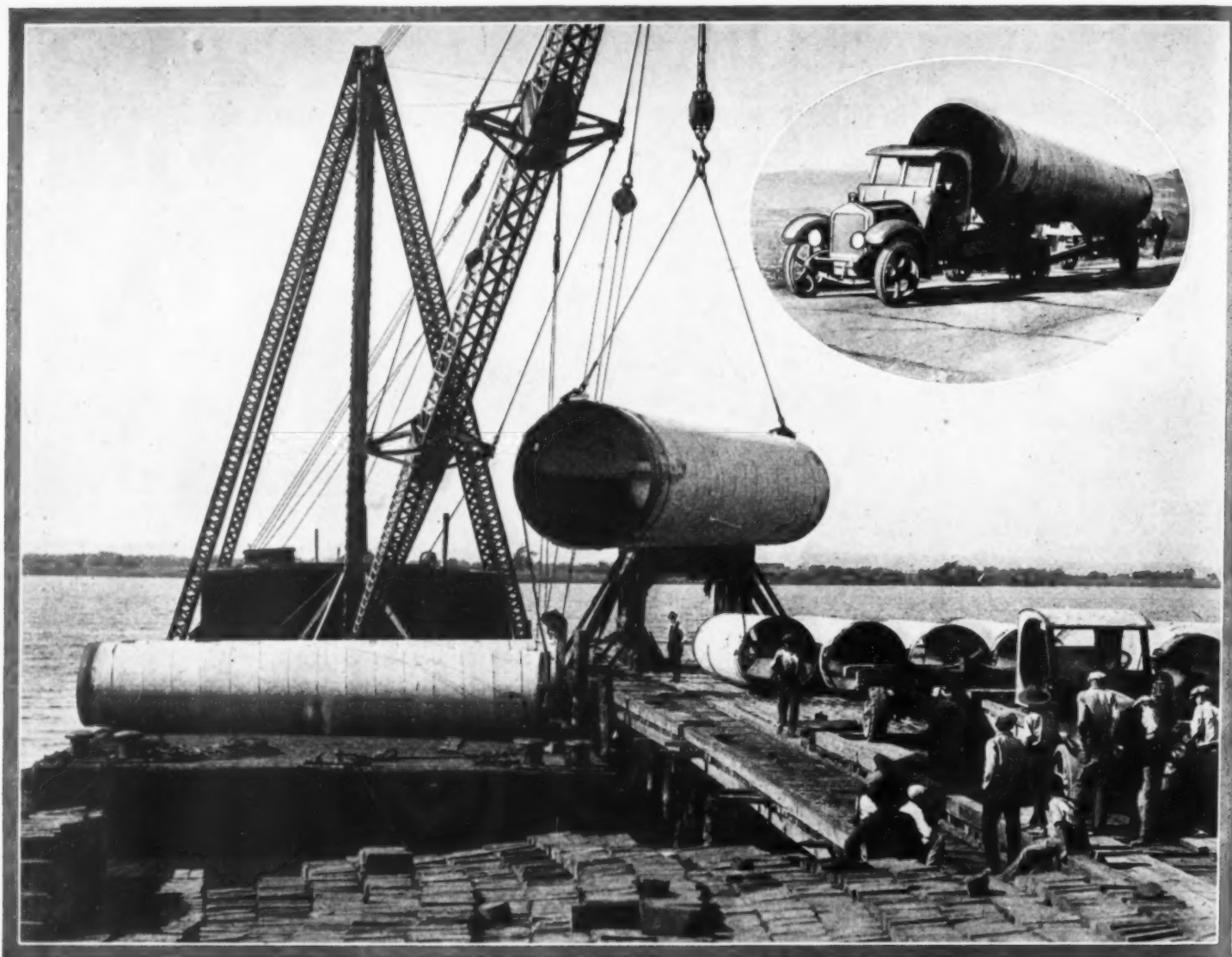
Above — A Northwest crane equipped with a 6,000-lb. bucket digging bell holes



At left — Another Northwest crane places the pipe

Below — The riveting gang on the job





The big sections of steel pipe are brought in in barges and carried to the job by trucks and trailers

tion engineer. Superintendents for Twohy Bros. Co. and Cavanaugh. A. H. Thomas is in charge at the Lafayette J. F. Shea are J. M. Dougherty, N. Versteeg, and C. J. Tunnel for Smith Bros., Inc.

An Austin trencher did part of the ditch digging





# Hilltop Tanks for Cincinnati



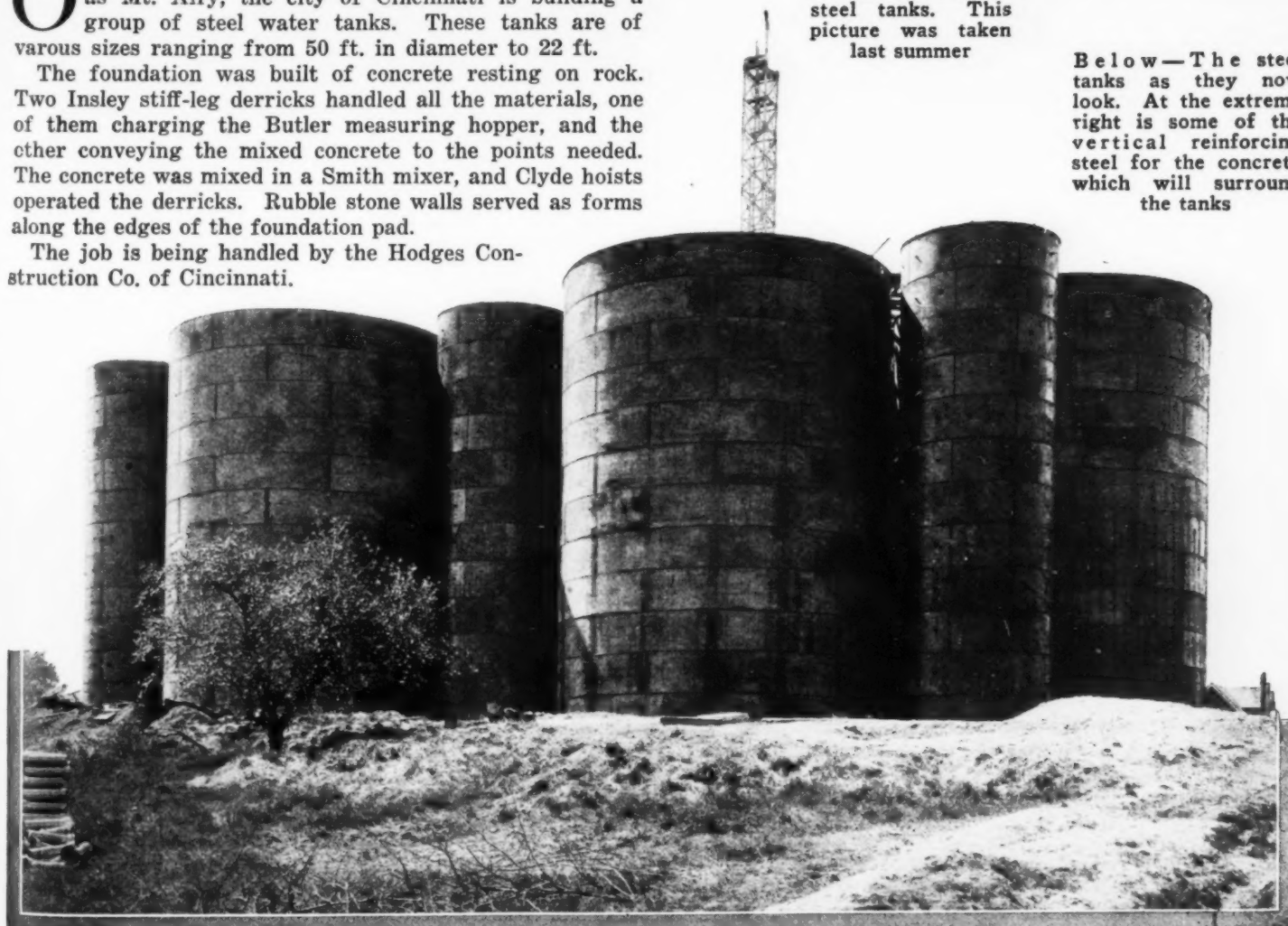
**O**N the highest point in Hamilton County, Ohio, known as Mt. Airy, the city of Cincinnati is building a group of steel water tanks. These tanks are of various sizes ranging from 50 ft. in diameter to 22 ft.

The foundation was built of concrete resting on rock. Two Insley stiff-leg derricks handled all the materials, one of them charging the Butler measuring hopper, and the other conveying the mixed concrete to the points needed. The concrete was mixed in a Smith mixer, and Clyde hoists operated the derricks. Rubble stone walls served as forms along the edges of the foundation pad.

The job is being handled by the Hodges Construction Co. of Cincinnati.

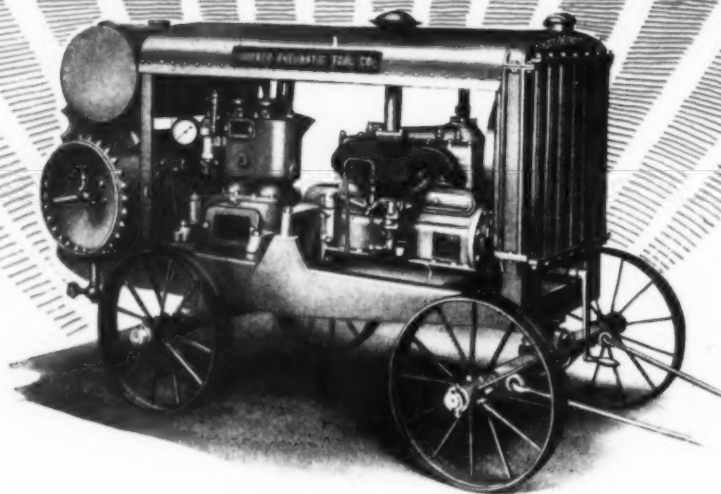
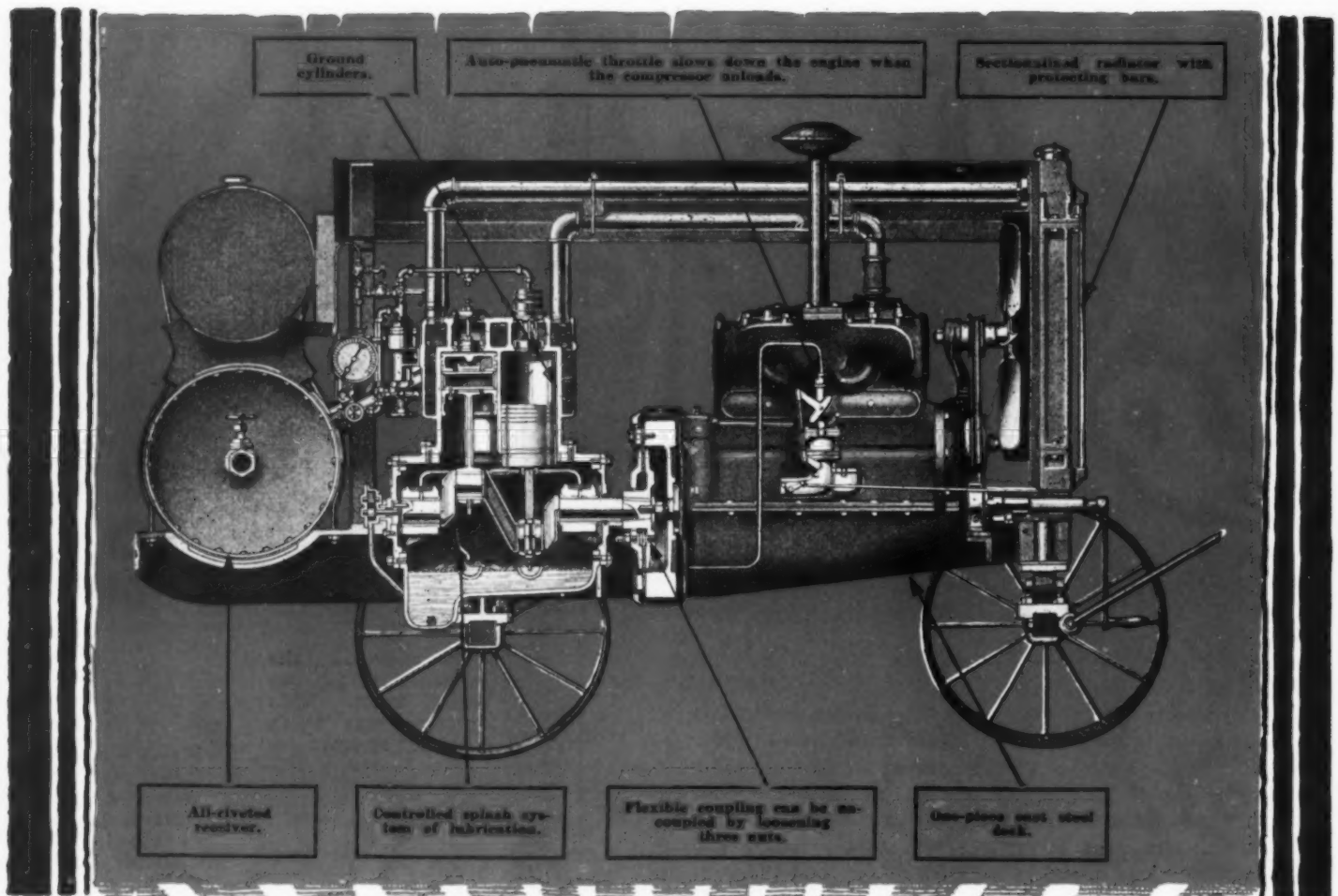
Above—Pouring the foundations for the steel tanks. This picture was taken last summer

Below—The steel tanks as they now look. At the extreme right is some of the vertical reinforcing steel for the concrete which will surround the tanks





# The Ideal Contract



## CHICAGO PNEUMATIC

6 East 44th Street,

# tor's Compressor

**PORTABLE COMPRESSORS** are the recognized standard for contracting work, especially where 24 hour performance is required. *Built* for better service, they *give* it.

Automatic full-pressure lubrication of main bearings, with pistons and cylinders continuously flooded with a mist of oil, banish lubrication troubles. All bearings are readily accessible without dismantling the compressor. Study the construction in detailed literature for other features indispensable to dependability and long life.

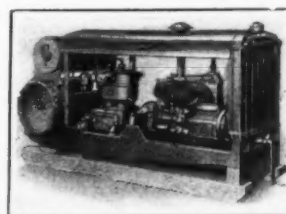
They have proved that low fuel consumption can be achieved, even under the highly fluctuating loads of riveting and chipping hammers, concrete busters, paving breakers and rock drills.

*High maintenance cost* hides beneath cheap equipment. Today a good air compressor is often the "Heart" of the whole equipment set-up for lowering labor costs on any given job. Buy your compressor on the basis of what it will *save*—not on price alone.

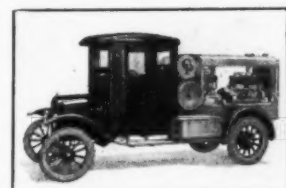
CP Compressors assure you the longest life at the lowest cost. Nothing essential to this end has been sacrificed in any model in the complete line. Fill in the coupon and let CP help you make all of your contracts more profitable.

## TOOL CO.

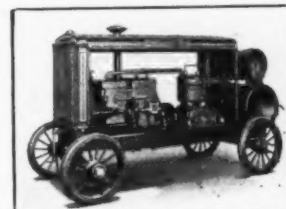
New York, N. Y.



Chicago Pneumatic Compressor Mounted on Skids—Semi-Portable.



Chicago Pneumatic Portable Air Compressor mounted on Ford Truck.



Chicago Pneumatic Portable Air Compressor mounted on rubber-tired wheels.

CP Portable Compressors for contractors are available in a complete line of sizes, including all skid and wheel mounted types. We also build for contractors: Rock Drills, Paving Breakers, Demolition Tools, Clay Diggers, Chipping, Calking and Riveting Hammers, Wood-Borers, Etc.

J-285

Chicago Pneumatic Tool Company, 6 East 44th St., N. Y. C.

Gentlemen: Please send me the Bulletin checked below describing equipment illustrated on these pages.

- ☐ Bulletin 850—CP Sinker Drills
- ☐ Bulletin 797—CP Portable Compressors
- ☐ Bulletin 796—CP Air Compressor (300 cu. ft. size)

Name .....

Address .....

# Step-by-Step Field Methods—

Follow the Red Line

1. The heel plate comes first



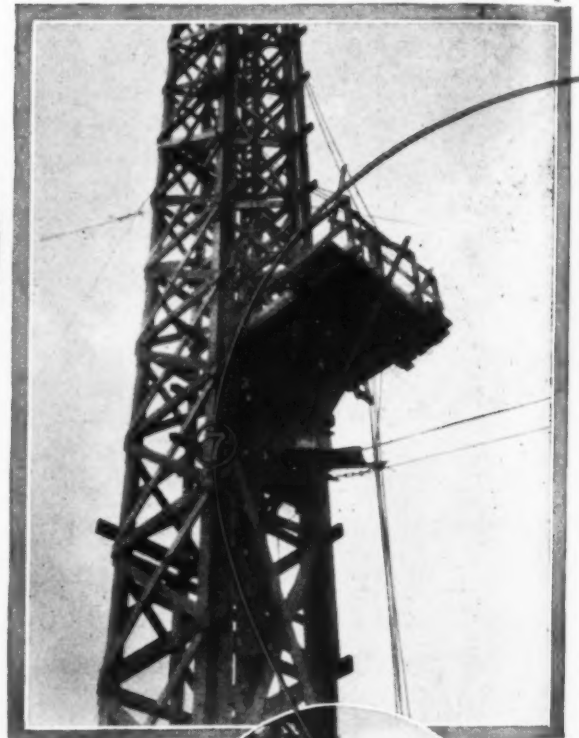
2. This is how the heel looks after it is installed

3. Boring holes for bolts to hold chute head

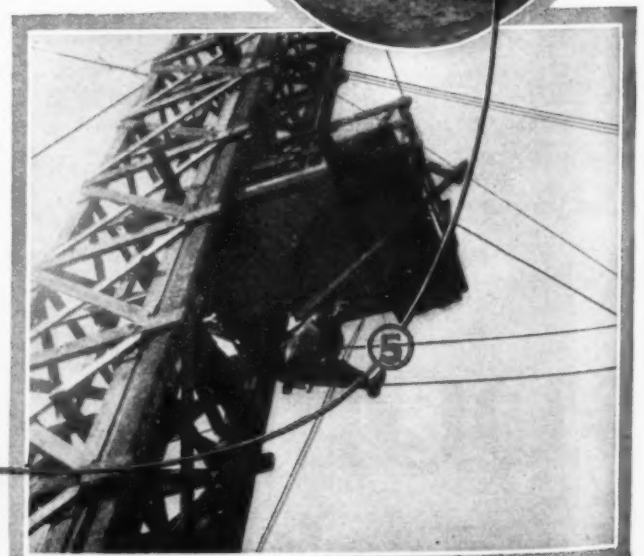


4. When chute head is on, cables must be connected

7. The section under the hopper is pulled into place



6. Raising the chute section which goes under the hopper



5. Some aerial work is necessary at this point



# ASSEMBLING A BOOM CHUTE

*These photographs were taken on the new building being put up for Sears, Roebuck & Co. in Los Angeles, by the Scofield Engineering-Construction Co. of Los Angeles. Other photographs of this job appear in the Blue Book on pages 9-12.*

15. Close-up of lower end of boom chute and upper end of next chute section

8. A close-up of the work of installing a chute section

14. Boom chute complete. Connection for second section at lower end

13. The second section of chute is put in place

9. Boom and cables with top section of chute in place

10. A little cable cutting is necessary now and then

11. Punching holes in a section of chute

12. The first section is wired to the cables



# Keeping Ahead

## Arizona Contractor Schedules Work on Dam to Forestall High Water

**E**VERYTHING from fire to flood has complicated the job of building the Frog Tanks Dam on the Agua Fria River 36 miles north of Phoenix, Ariz. This dam, also called Lake Pleasant Dam, is said to be the longest and highest of the multiple arch type in the world. It is 2,200 ft. in length at the crest with maximum elevations of 256 ft. above bed rock and 171 ft. above the river bed.

Records over a period of 35 years showed that June would be the best month in which to work, as the river is very low at that time and by the middle of July floods are to be expected. The plan adopted required excavation to bed rock and completion in the dry of the river buttresses and arches to 12 ft. above the stream bed before the middle of July. Buttress No. 7 presented a peculiar problem because of its low bed rock, and a plan had to be worked out for constructing it later.

Work began on April 15, 1926, and was carried forward as rapidly as possible in order to forestall the July

At left — Flood passing over arches after completion of Buttress 7

Below — Crane working in excavation for first section of Buttress 7





# ad of the Floods

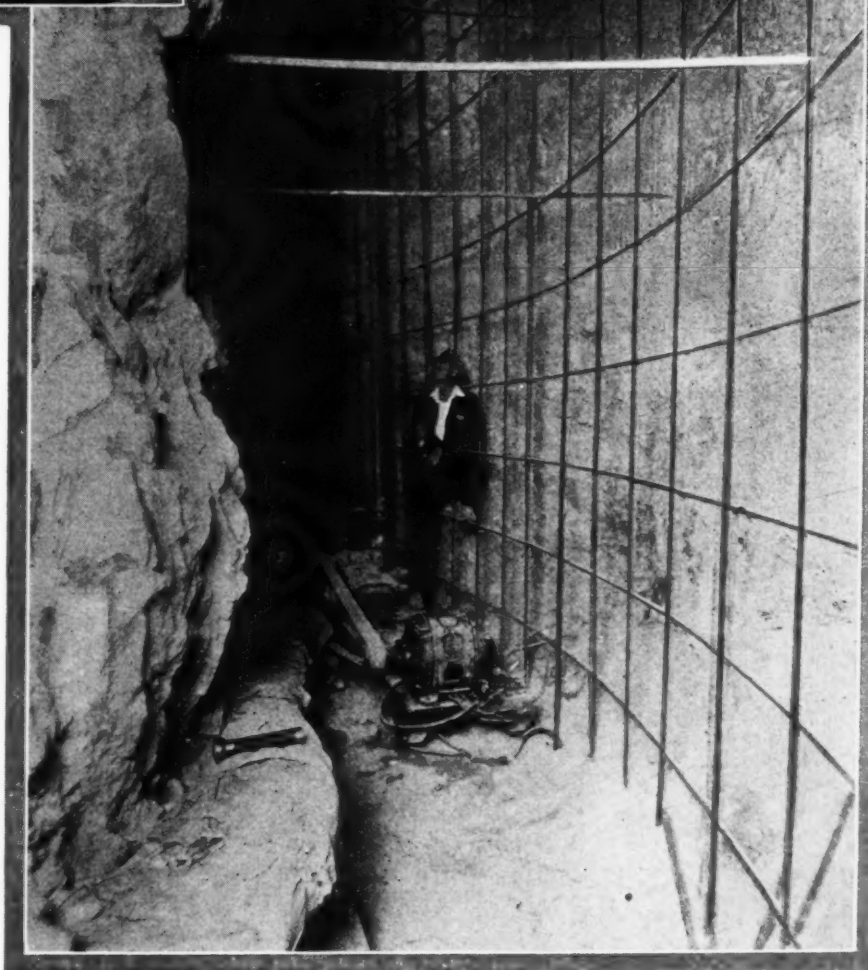


Above — The opening of shaft in volcanic tuff

At right — J. G. Tripp, superintendent, 90 ft. below the surface.

floods. A slackline cableway excavator dug a lake in the river channel, the excavated material being washed and stored and later used in concrete. About 35,000 cu.yd. were removed in this way. Batteries of pumps on a barge began dewatering the lake and, finally, was beached beside a sump. Draglines and trucks then continued the excavation and started construction of levees around the pit. The levees were carried to a height of 20 ft. and were riprapped with sacks of rock, the toe of the upstream dike being protected by wood sheet piling, in addition. The draglines excavated 30,000 cu.yd.

On June 19, 1926, six days after the beaching of the barge, the first batch of concrete was poured. Between this date and July 12, all concrete structures necessary to keep the river under control were completed, 20,000 cu.yd. of concrete being placed in this time. A 1-cu.yd. mixer on the upstream dike, a 1-cu.yd. paving mixer on the downstream dike, and a 1-cu.yd. mixer in the central mixing plant discharged into chutes leading to the forms. All three mixers were served by trucks. About this time, fire entered into the situation, completely destroying the





crushing and screening plant, but by rushing material from the Pacific Coast, it was possible to rebuild the plant and begin operations only 24 hours late.

There are five buttresses in the channel section of the dam. They are hollow, are 16 ft. wide, and are connected by full diameter arches on 60-ft. centers. Arches 4-5 and 5-6 were left open to permit the floods to pass. Buttress 6 was poured solid and was strengthened to resist pressure from high water. A concrete tail dam connected this buttress with the dikes.

In constructing the continuous concrete cutoff wall of buttresses and arches across the river, a plug of concrete was poured in the low spot under the toe of Buttress 7. An arch dam was built on top of the plug, the sides of the can-

yon in the bedrock forming the buttresses for the dam. Arches 6-7 and 7-8 were then carried to 12 ft. above stream bed on a foundation composed partly of bedrock and partly of arch dam. The site of Buttress 7 was thus completely surrounded by a cofferdam consisting of the concrete cutoff wall on the upstream side, and the dike on the downstream side.

An 87-ft. shaft was sunk below the stream bed at the heel of Buttress 7 which made it possible to pump out any water. Short sections were excavated and poured, working back from the cutoff wall and always keeping as close as possible to solid concrete. Muck was removed in skips by crane. Grout pipes were used in each section to fill the shrinkage seams between the pours. Buttress 7 was completed on

The upper panoramic photograph shows the dam in October, 1926. Derrick stands on completed portion of Buttress 7 which was finished four days later



November 3 after fourteen floods, varying in size from 300 to 13,000 sec.ft., had passed safely during the construction period.

At the foot of the slope on the east bank of the river, it was necessary to go down 90 ft. through rhyolitic tuff in order to get through to the foundation. An elaborate system of drains and automatic pumps had to be installed even at this depth to prevent seepage. The tuff slakes disastrously when exposed to water.

A spillway, 712 ft. long, equipped with twenty-nine Taintor gates 23 ft. long by 16 ft. high, is being constructed on the west bank of the river. The overall length of the job, from the end of the dam to the end of the spillway, is 3,900 ft. A central washing and mixing plant containing two

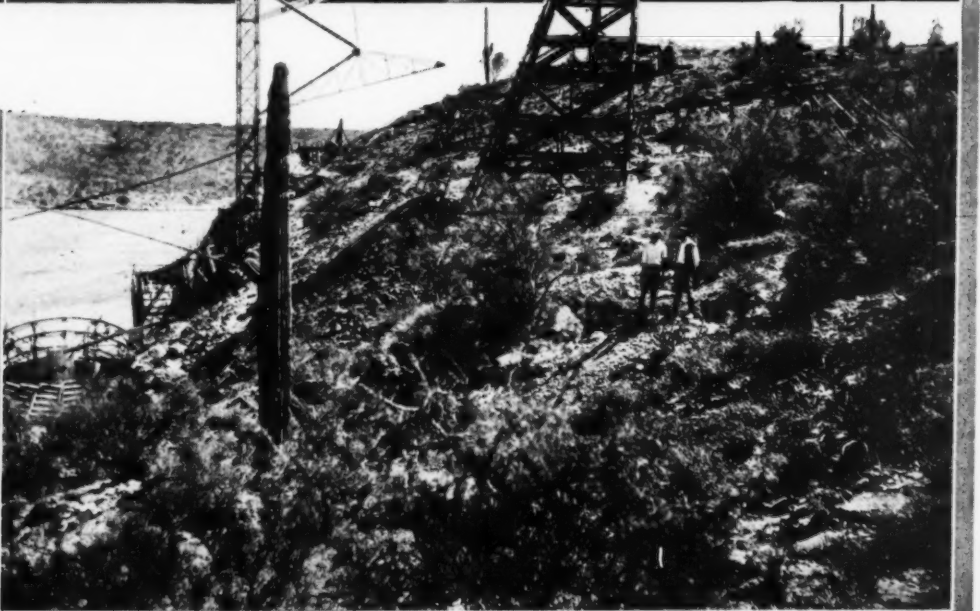
1-cu.yd. mixers is serving the entire job through a system of spouts and tramways.

The reservoir formed by the dam will have a storage capacity of 173,500 acre ft. The water will be used to irrigate 39,026 acres of land in Maricopa County.

In the twelve months 80 per cent of the 100,000 cu.yd. of concrete in the dam was placed. Cement, lumber and equipment were hauled in to the job over 20 mi. of road maintained by a sub-contractor. The dam probably will be completed by October 1. J. G. Tripp is superintending the work for Carl Pleasant, Inc., Phoenix, Ariz., the contractor. J. E. Broton is assistant superintendent; A. J. Lewis, carpenter superintendent; C. G. Clamp, master mechanic, and H. Festich, labor boss.

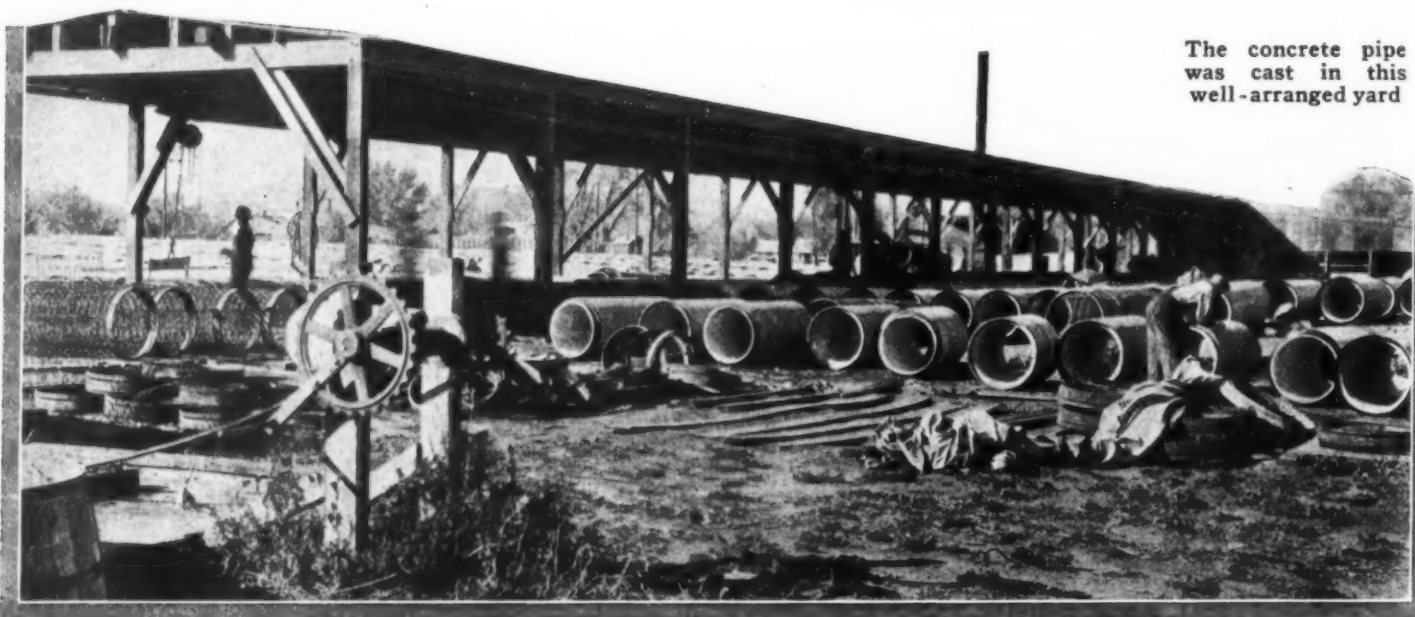
At left—Site of Frog Tanks Dam eight days after work began

The lower panoramic photograph was taken after work had been going on for just twelve months. The river is passing through sluice gates between Buttresses 5 and 6





# Fort Collins Doubles



The concrete pipe was cast in this well-arranged yard

**A** NEW water supply system to double the present available quantity has just been completed at Fort Collins, Colo. Mechanical filters, 13 miles of concrete pipe, a 7,500,000-gal. concrete reservoir, and a distributing system of 13 miles of cast iron pipe were included in the work. The

city's supply has been increased to 13,000,000 gal. a day.

The filters are located in the canyon of the Cache la Poudre River. Between them and the reservoir are 43,000 ft. of 24-in. and 9,000 ft. of 20-in. Lock Joint concrete pipe. The flow line crosses under the bed of the river six times

The flow line was taken through difficult country





# es Its Water Supply

Building the reservoir. Forms for beams were placed under the wall slabs



including an 800-ft. tunnel on the 20-in. section of the line. A 27-in. Lock Joint distributing main 16,500 ft. long carries the water from the reservoir to the city system.

Steam shovels and draglines were used in excavating for the filters, flow line, and reservoir. A Link-Belt dragline equipped with a scraper did the backfilling at the rate of 2,000 ft. a day under good conditions.

The Lock Joint Pipe Co. of East Orange, N. J., were the general contractors for the flow line. Spotts & Malcolm of Loveland, Colo., have the filters; J. Finger & Son of Longmont, Colo., the reservoir; and J. S. Swartz of Colorado Springs, Colo., the distributing system. E. A. Lawver is city engineer. His assistant in charge of the flow line and the city distribution system is D. W. Roscoe.

## Historic High Bridge Undergoes Alterations

**H**IGH BRIDGE, finished about 1840, where Croton water was first brought into New York over the Harlem River, is in process of alteration. The river spans are being replaced with a steel arch. The job has been awarded to the

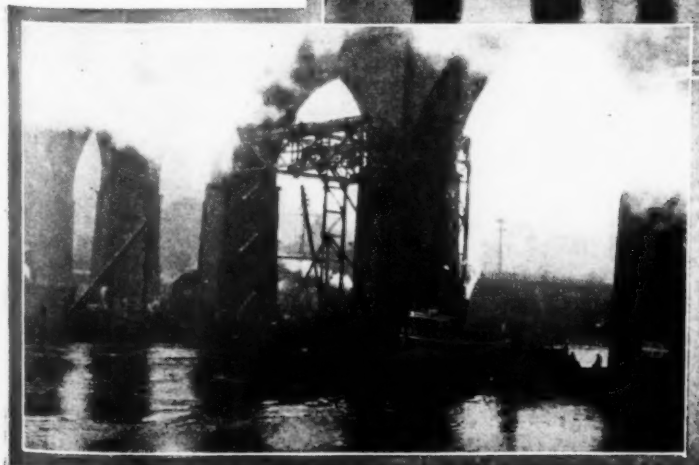
P. T. Cox Contracting Co. of New York City. Cofferdams have been built around the piers to be removed and steel

false work is now being erected. The lower photograph at the right shows the preparation of the abutments for the steel arch.

Two views of High bridge as it now appears



Preparations for placing the steel arch



# Safety on Construction Jobs—



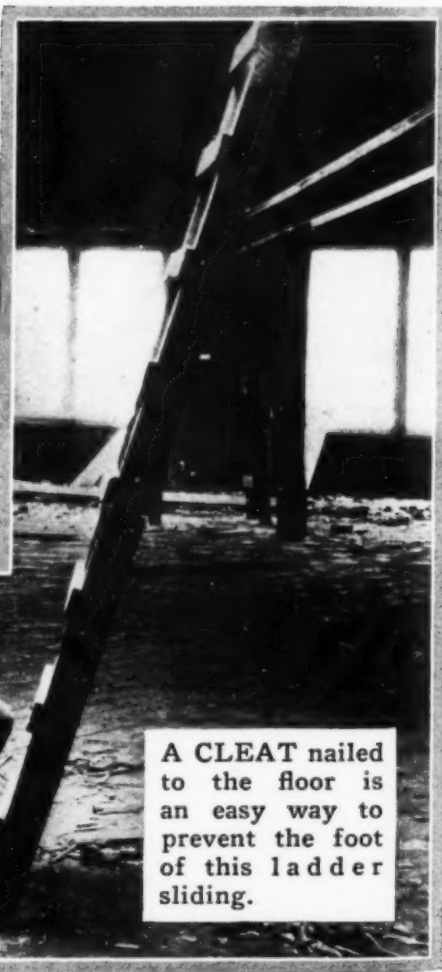
**FALLS** account for many construction job accidents. Don't leave loose objects on stairways to trip workers.



**A LADDER** is only as good as its weakest rung. Use sound lumber, securely nailed to insure safety of men on the job.

**FOR** the field man of construction and industry, just as much as for the contracting company that pays compensation insurance premiums, safety on the job has a cash value.

Construction accidents are costing \$150,000,000 a year, according to estimates by the National Safety Council. The Associated General Contractors of America have become active in a campaign to reduce the toll taken by carelessness



**A CLEAT** nailed to the floor is an easy way to prevent the foot of this ladder sliding.



**GOOD FORM** of construction job ladder, but why run the hose line across it to trip the man starting down?



**ELECTRIC SAW** guarded by shield over blade.



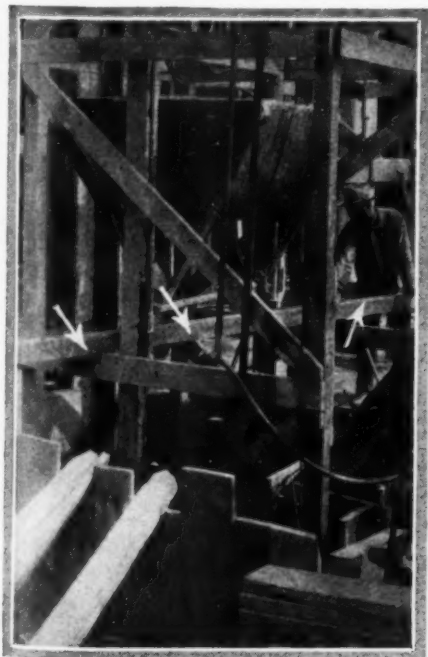
# A Few Practical Suggestions to Prevent Accidents

in construction throughout the country. In the Detroit territory alone their efforts have prevented injury to scores of workers and have led to a reduction of 50 per cent in local insurance rates.

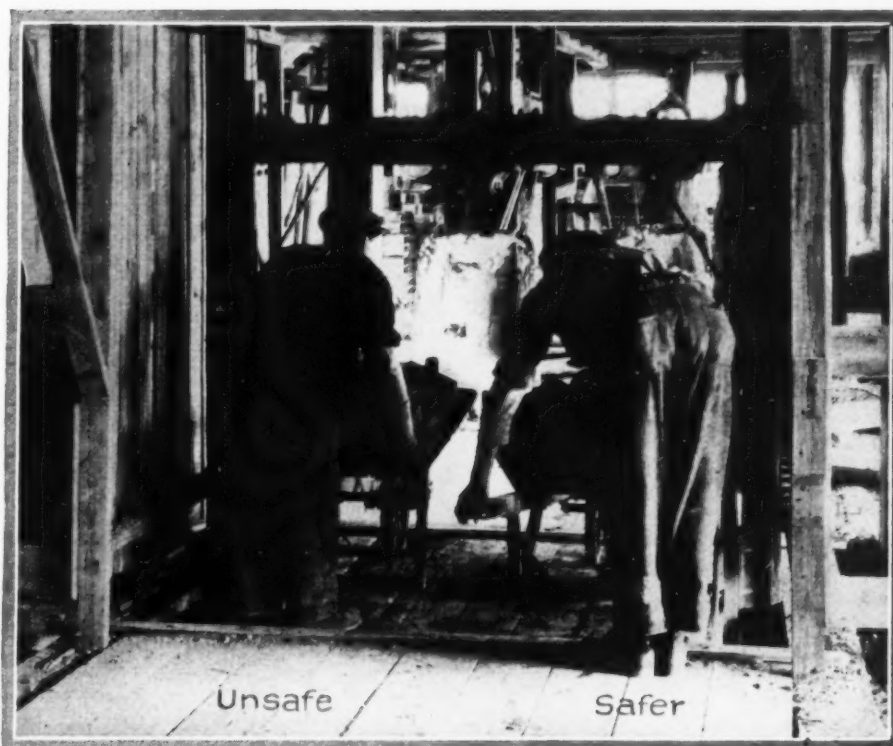
**C**OMMON causes of job accidents and measures to insure safety are indicated in the pictures on these pages, many of which were obtained from the National Safety Council. Study them and apply them to *your* job.



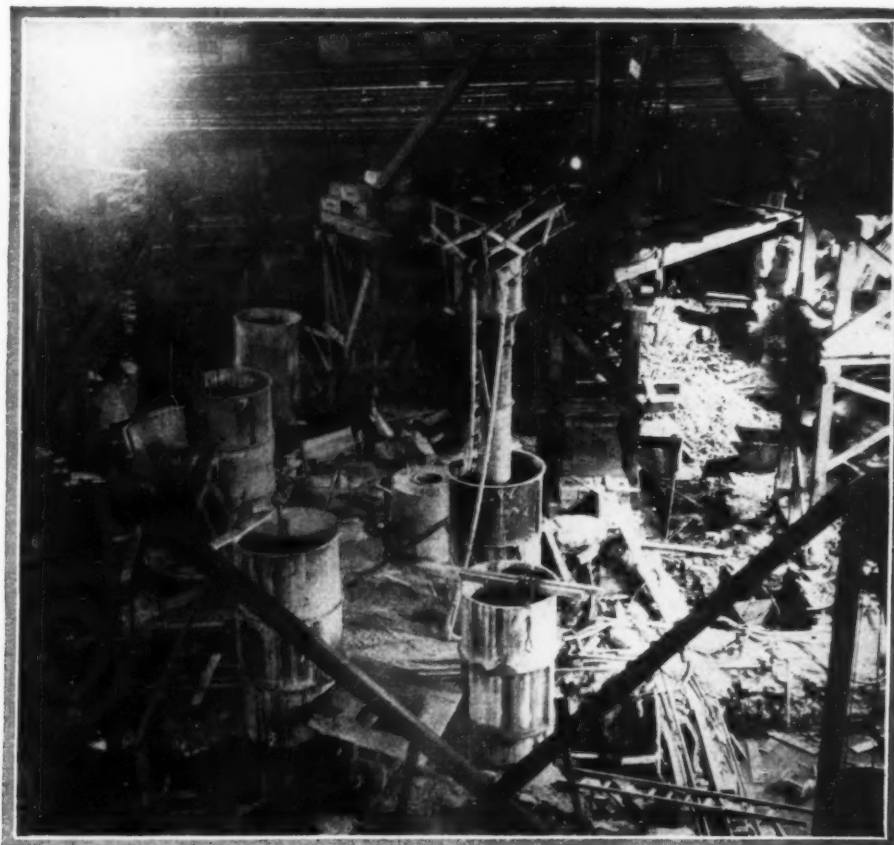
GOGGLES and gloves play an important part in preventing accidents in welding.



THE TIMBER placed across this elevator shaft is a safeguard against the skip dropping and injuring the man working at the bottom.



IN LOADING material elevators workmen should stay off elevator platforms. It is safer and better to keep a footing on the stable loading platform. The hoist runner might misunderstand a signal and start up too soon.



ADEQUATE LIGHTING, without glare and with shadows eliminated, made night work less dangerous on the substructure for the new Savoy-Plaza Hotel, New York, by the Foundation Co., New York, subcontractors for the George A. Fuller Co.



# Additional Hints on How to Make



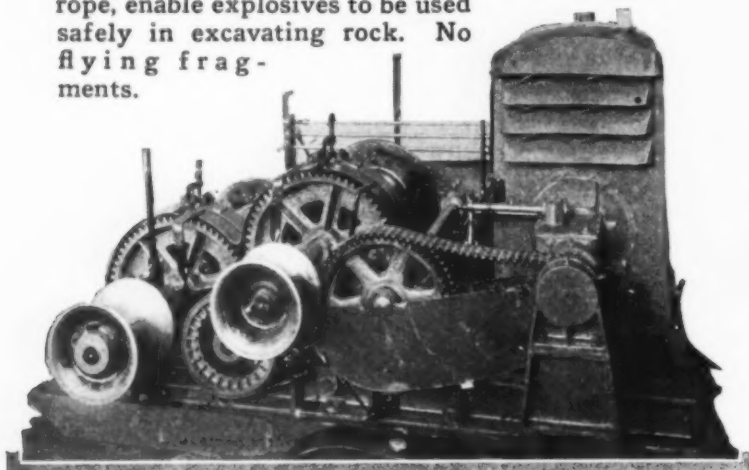
THIS is the result of taking a chance on cleaning up underneath a descending steam shovel dipper boom.



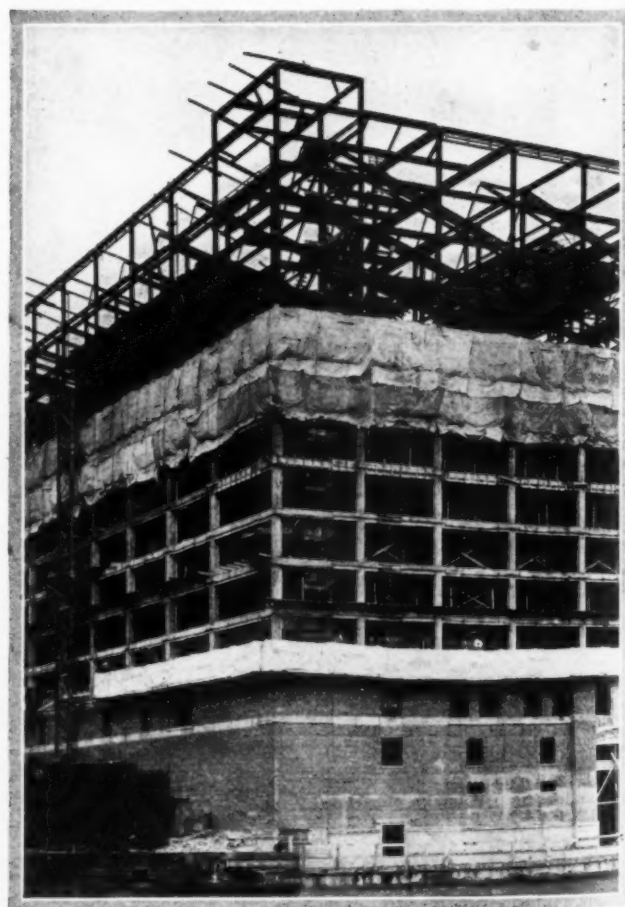
"USE a safety belt" is the accident prevention slogan these pictures emphasize on a structural steel job.



IN BUILDING New York subways under streets and close to store fronts mats of wire or manila rope, enable explosives to be used safely in excavating rock. No flying fragments.



SAFETY features on this two-drum Mundy hoist are protective chain guard (upper half removed), engine housing, sheet steel gear guards.

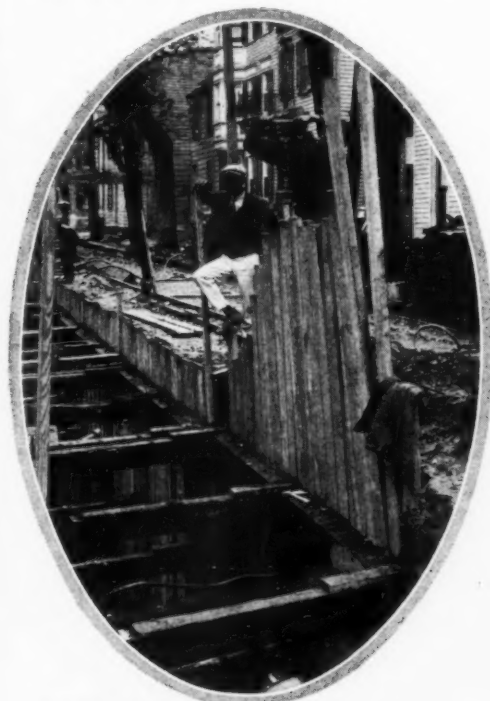


HENRY ERICSSON CO., Chicago construction company, in addition to protecting fresh concrete from freezing, has enclosed with canvas a well-built bricklayer's scaffold. More bricks per day and fewer accidents combine to make this enclosed scaffold pay for itself.

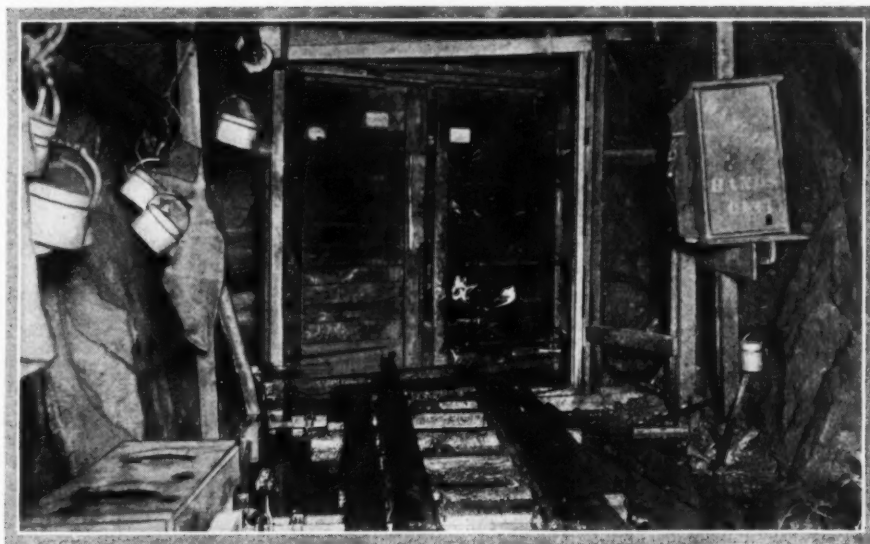
# the Job Safe for the Working Crew



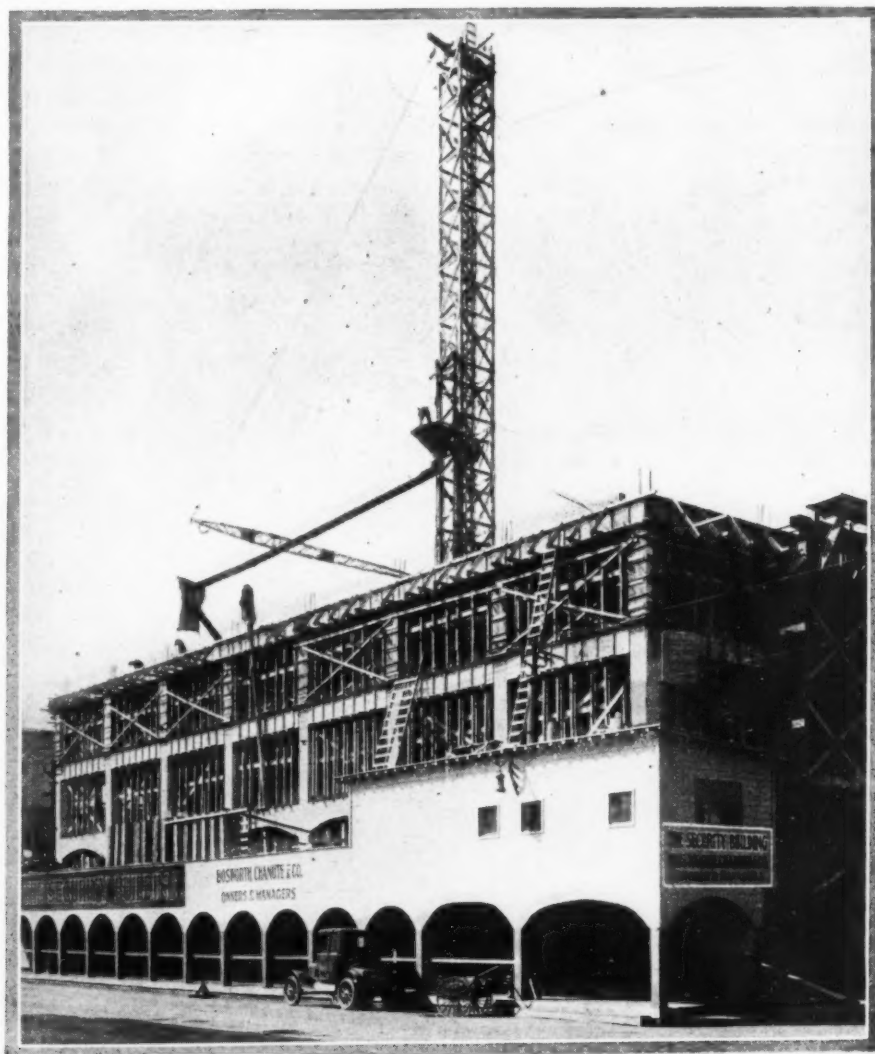
IN HOISTING heavy structural steel members be sure to use a tag line to guide the load and prevent swinging or spinning during the trip.



WORKERS in deep sewer trenches protected by continuous sheeting and cross-bracing brought to firm bearing with screw jacks.



IN THE MOFFAT TUNNEL, Colorado, automatic swinging draft doors in cross cuts keep the smoke and blasting fumes in the railroad tunnel from entering the water tunnel and affecting the workers.

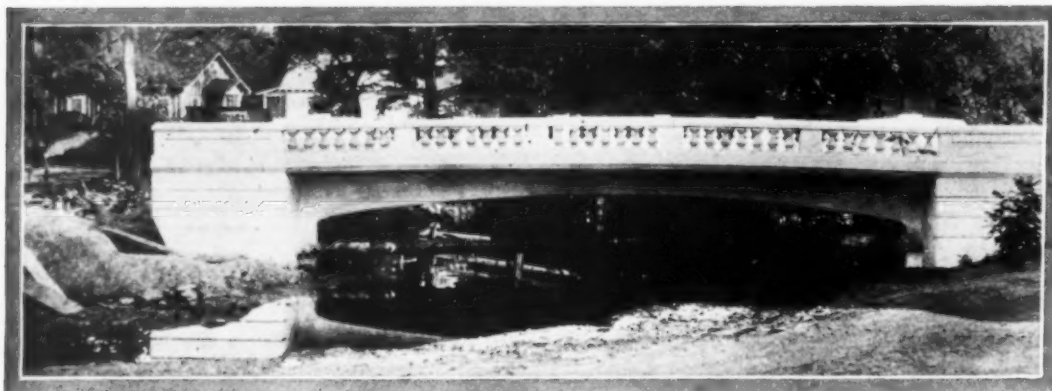


SIDEWALK ARCADE in Denver, Colo., provides protection for pedestrians, and in addition working, storage and office space.



# A Forty Foot Bridge

Various Steps in Construction of Small Concrete Span  
Across Stream in Fayetteville, N. C.



**A** DETAILED story in pictures of the building of a small bridge has been sent to *Construction Methods* by Thomas D. Rose, City Engineer of Fayetteville, N. C. This bridge, known as the Ray Avenue Bridge, was designed and built by Steel & Lebby of Knoxville, Tenn. The city accepted this company's design as an alternate to designs prepared by Mr. Rose.

The bridge is of the deck type with rigid frame. It has a clear span of 40 ft. and carries a 20-ft. roadway and two 5-ft. sidewalks. Mr. Rose calls attention to the fact that

the appearance of the completed structure is marred by the gas main which shows all too plainly in most of the pictures.

During the progress of the work, Mr. Rose supervised the job for the city checking design and stress sheets furnished by the contractor, establishing lines and grades and maintaining general oversight while the work was going on.

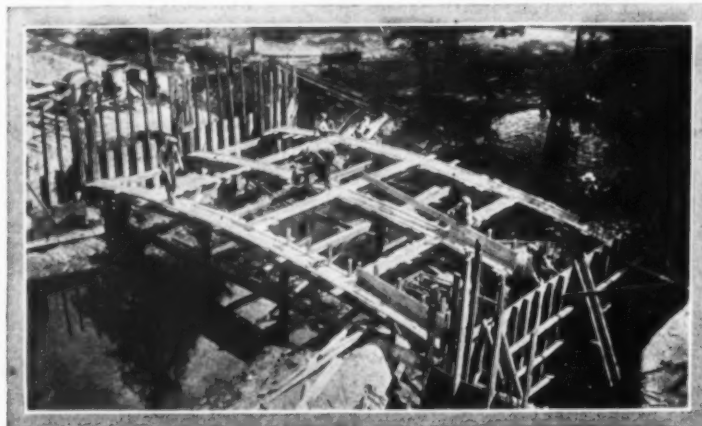
The bridge was recently completed and is now in service. It is typical of the small concrete bridges that are being built in every section of the United States by state, city and township authorities.



An old wooden bridge was first removed

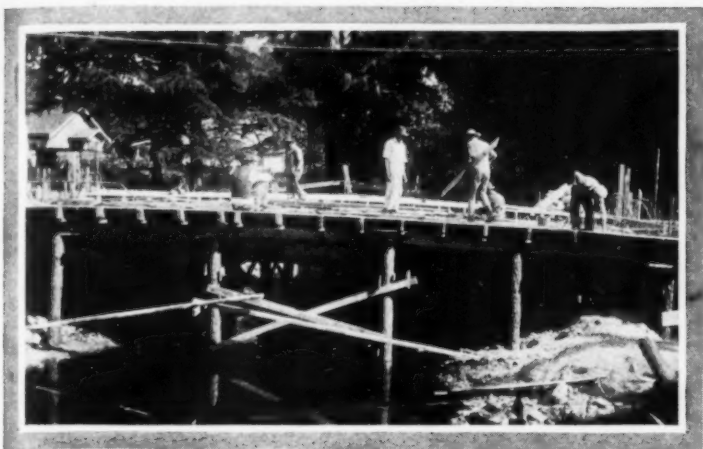


False work in place for the new structure

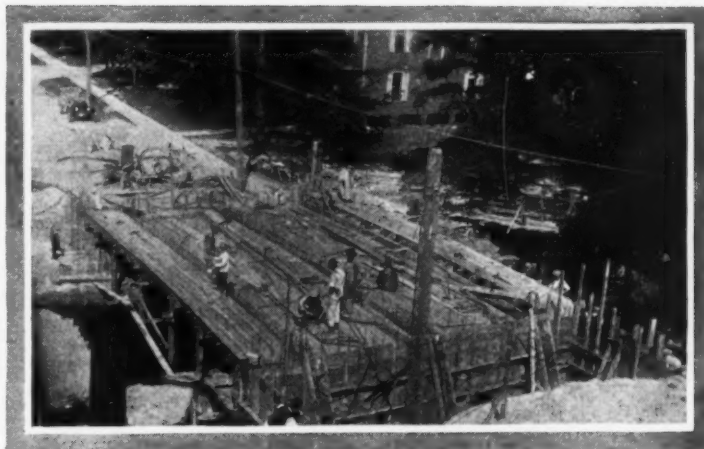


Setting forms for girders. Careful construction was needed where the girders went back into the abutments, like counterforts

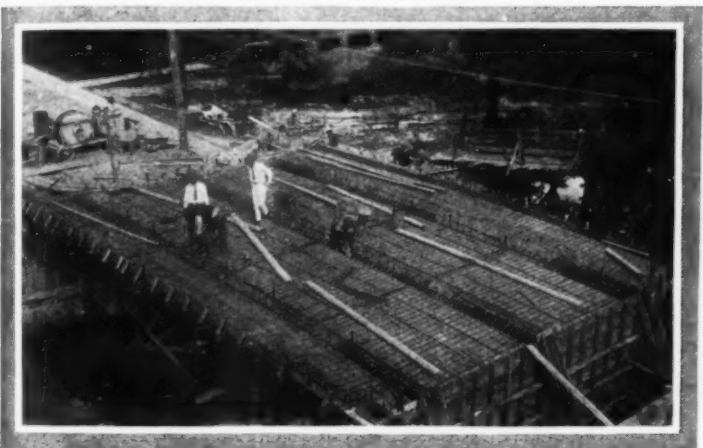




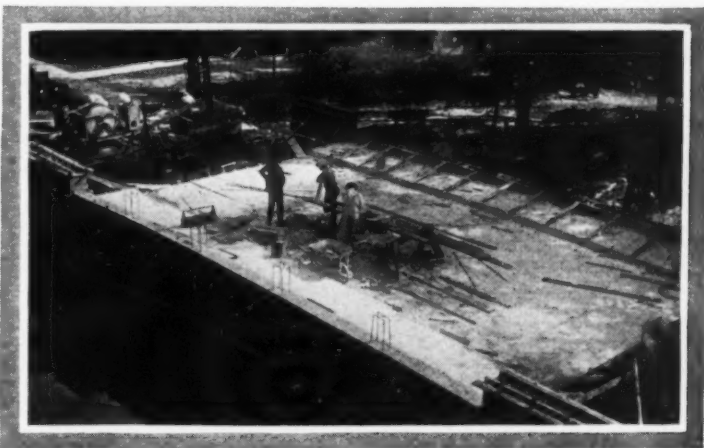
Preparing the false work and forms  
under the sidewalks



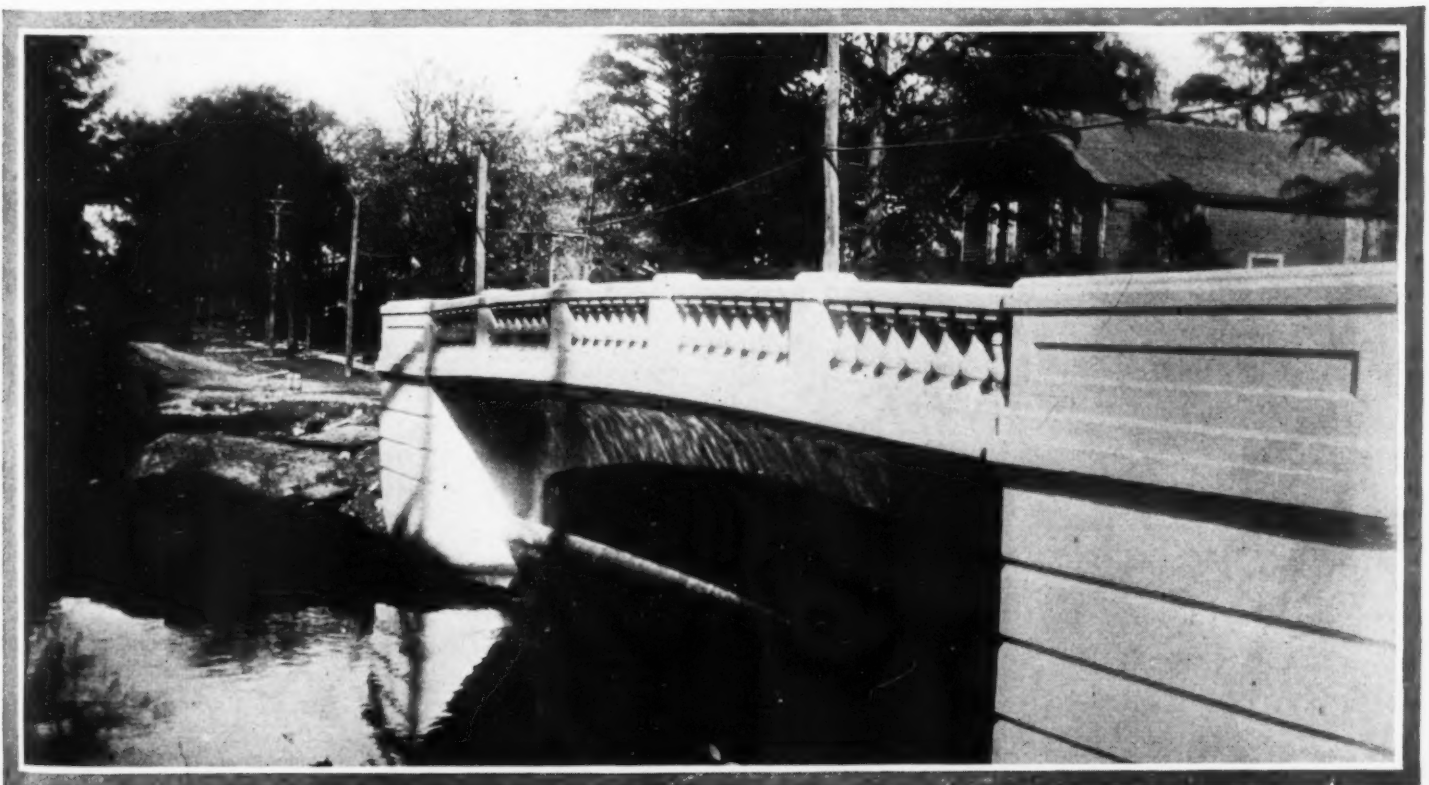
Setting reinforcing steel in the  
girders



Girder and slab steel in place. Men  
setting forms for curbs



All concrete poured except hand rail.  
Mr. Rose is the man with his hands  
on his hips



The completed bridge

# Remaking a Florida Highway

One-Half of Road, Where Detour Was Impracticable,  
Always Open During Surfacing Operations

**W**HEN a thing *must* be done, a way to do it can usually be discovered or developed. When the job of surfacing 8½ miles of the Deland Road in Florida came up for consideration, the problem of handling traffic was of primary importance. The usual custom of stretching a barrier across the road at an intersection bearing the bad news "DETOUR" was out of the question, since there was no place to detour. The methods adopted by C. L. Vining, County Commissioner of Volusia County, are graphically told by the accompanying photographs. E. L. Reese, superintendent of the construction work, states that these methods proved successful for the construction crew and satisfactory to the motoring public.

The Deland Road is an exceedingly busy highway stretching through a low marshy section of Volusia County. It carries a traffic load averaging 3,500 vehicles a day and traffic was not stopped at any time during the reconstruction and surfacing of the road. The first six miles of this

road were originally constructed with an 8-in. base of soft native ojus rock. The last three miles were built of oyster shells. The road had been surface treated at various times. Unprotected macadam, however, even when laid on a dry sub-base, will not withstand the shock and torque of speeding tires forever and the metal finally began to ravel out under traffic, permitted moisture to reach the base and developed chuck holes, which were ruinous both to the road bed and vehicles. Maintenance was entirely too costly and inadequate to keep the road in proper condition.

It was finally decided to surface the road with Kyrock. Mr. Vining, County Commissioner, decided to build a 24-in. concrete curb on either side of the old road bed. This was done for the double purpose of (1) extending the pavement to a width more suitable for the demands of modern traffic and (2) to prevent the macadam and shell base from spreading in the marshy sub-base. Some sections of this roadway extend through such dense foliage that there is no opportunity for the sun to dry up the heavy dew. In such places



Mixing slag and Kyrock and then placing it on the road. One-half of the highway is always open for traffic







Above—The Deland Road was in bad condition as shown in this photograph



Below—When the resurfacing had been completed the road looked like this

the old surface was fired with gasoline to dry it out before patching and surfacing. An occasional water moccasin, lazily watched the operations from the marshy side lines.

The old surface was not scarified and no new top course of rock was added as is the usual practice in this kind of construction. Instead, a Kyrock cold patch was used to bring the old surface to grade. This was made up on the job in quantities as needed by mixing standard Kyrock with  $\frac{1}{4}$ -in. slag in equal parts. This mixture was first tamped into the larger holes, some 8 in. deep, until they were leveled, then spread over badly worn areas and rolled in order to eliminate the old waves and depressions and bring the

surface up smooth to grade. After rolling this cold patch into place the surface was paint-coated with a 60 penetration cut-back asphalt cement applied with mops and it was then ready for surfacing.

In order to cause the least possible inconvenience to traffic the new wearing surface was laid on one side of the road at a time, allowing traffic to use one-half the road. The surfacing was done in stretches of 300 ft. at a time and immediately a section was rolled traffic was turned on it and the crew transferred to the other half of the road. Thus traffic was not interrupted.

The upper photograph shows the roller compacting the new surface. In the lower picture asphalt taken directly from the heater is being applied with mops

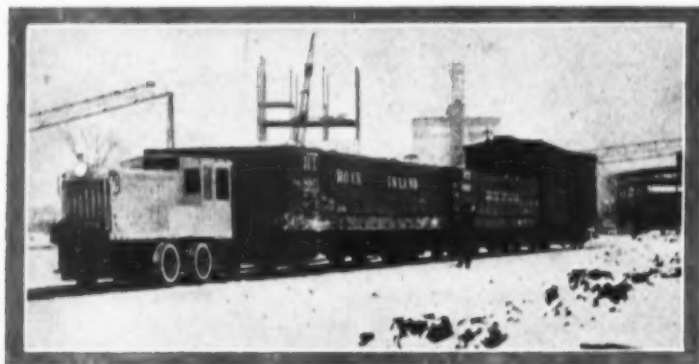




# NEW EQUIPMENT ON THE JOB

## A Gas-Electric Locomotive

A gas-electric locomotive that will handle remarkably heavy loads has been put on the market by the Davenport Locomotive Works, Davenport, Iowa. This machine is operated by a combination of a gasoline engine and an electric generator. The generator is connected directly to the gasoline engine and furnishes electric current for electric motors



that are applied to each axle, all of the wheels being drivers. Power and speed are regulated through a controller, like that on a street car, and the engine is particularly efficient in starting heavy loads, the danger of stalling the engine being eliminated.

## New Tractor for Hard Work

A 6-ton tractor, known as Model H, is now being produced by the Monarch Tractors Corp., Springfield, Ill. This



machine is so designed that it will pull a heavy 10-ft. grader under difficult conditions and handle other loads which would be too great for small tractors. The driver's seat is

located at the rear of the tractor with a truck type steering wheel and column, an arrangement which differs from the usual steering apparatus on tractors.

The new 6-ton machine is supplied with power by a 4-cylinder Stearns-Monarch motor. It provides 40 hp. at the drawbar. The machine is equipped with an electric starting outfit. In connection with the electric starter, a full electric lighting outfit also is provided.

## Iron Mule Works in Close Quarters

The machine in the accompanying photograph has been christened the Iron Mule by its manufacturers, the Hughes-Keenan Co., Mansfield, Ohio. This particular machine is owned by the M. J. Smith Construction Co. and is working



on the Bachman Twin Tunnels job at Chattanooga, Tenn. It has been doing good work on this job, in one day moving 37½ yd. of dirt per hour. The use of this machine resulted in considerable saving to the contractors.

The gravity dump body of the Iron Mule is mounted on a Fordson tractor, which furnishes the power, in such a way that it is in front of the driver, the steering gear being reversed, so that he can see at all times just where he is going. This enables him to place his load with the minimum of jockeying. A 90-deg. dumping angle also makes it possible to unload the machine quickly.

The Iron Mule can travel in extremely rough going—mud, loose dirt, sand, etc.—and can go into places where larger trucks would be unable to go. It also has the merit of being able to turn very quickly and in close quarters.

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Strength Obtained on Typical Jobs Thru Use of High-Early-Strength Concrete made according to thoroly tested methods with standard—not special—Universal cement.				
Location	Type of Job	Date Placed	Compressive Strength Pounds Per Square Inch	
La Grange Park, Ill.	Street Intersection	July, 1926	3 days—2360	7 days—3600
Duluth, Minn.	Business Thorofare	Sept., 1926	4 days—2130	6 days—2950
Chicago, Ill.	Loading Platform	Sept., 1926	3½ days—4070	No further tests
Wheeling, W. Va.	Street	August, 1926	3 days—2245	7 days—3130
Columbus, Ohio	Reinforced Deck Slab	October, 1926	2 days—2550 3 days—3120	No further tests
Ordinary Concrete has a Compressive Strength of about 2000 lbs. per square inch at 28 days.				

The results shown above were obtained not in the laboratory but in the field on the jobs indicated. The standard Universal cement used in all of above jobs was of the same uniform quality. Difference in strengths is due to variations in proportioning, mixing, placing and curing of the concrete. As strength of this concrete increases with age, the user not only gets high earlier strength but at the same time a higher ultimate strength that makes it stronger and better concrete forever after. For further information, use the coupon.

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210 South La Salle Street, Chicago

Without obligation, please send me detailed information on methods for securing strong concrete in 3 days with standard—not special—Universal cement, the same quality Universal regularly used.

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*When time is money*  
use High-Early-Strength concrete  
made with standard (not special)  
Universal Cement

## Actual Construction Records Show Success of High-Early-Strength Universal Concrete

Here are results obtained with *High-Early-Strength* Universal Concrete on actual construction work.

These show the value of using fully tested methods and standard—not special—Universal cement to obtain High-Early-Strength concrete.

As such concrete also has a higher ultimate strength, it is permanently *better* and *stronger* concrete.

The accompanying coupon will bring full details promptly.

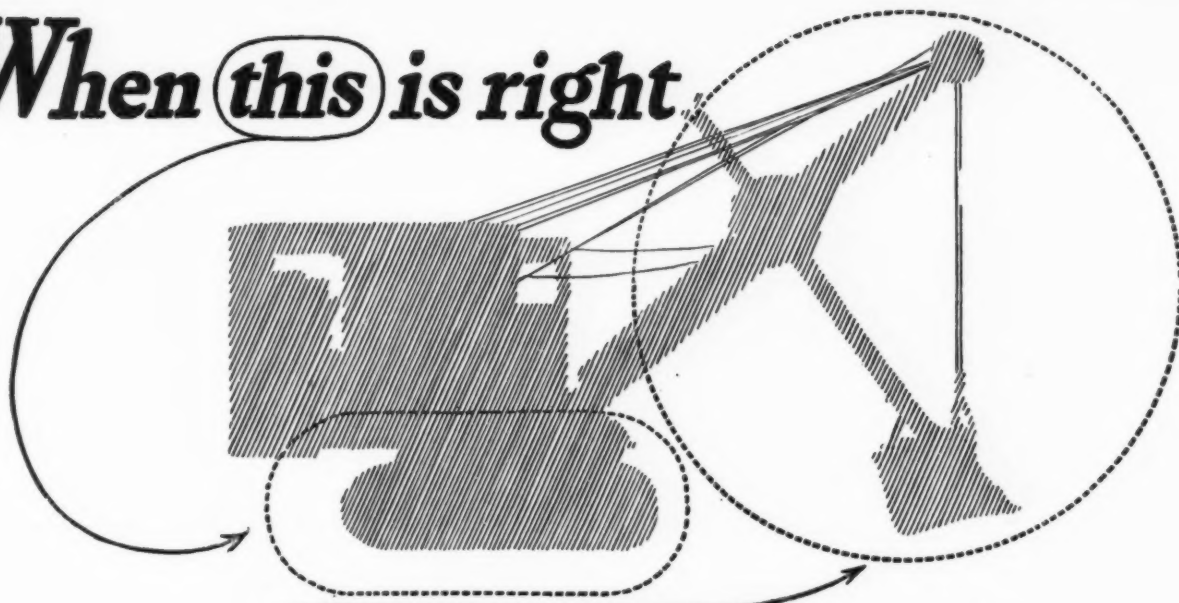
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**Concrete for Permanence**



**When *this* is right**



***this* will dig profits**

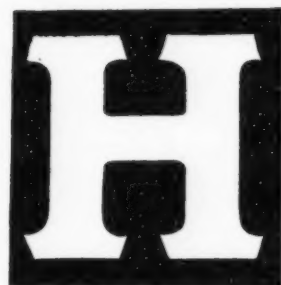
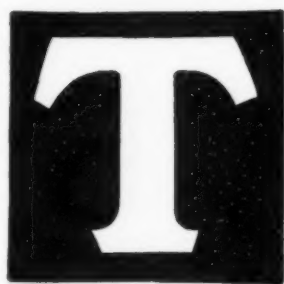
**W**HEN the Lorain 75 was designed it was built from the bottom up to be the most completely dependable, stay-on-the-job machine ever constructed. And the first step was to get its "feet" right.



*The Thew Center Drive Crawler accomplished that.*

You know crawlers. You know how much it costs you to keep the ones you now own in steady operation. Can you keep yours on the job for \$2.31 a month? That's the average cost for all Thew Center Drives in use. Thew Center Drive Shovels are built in steam, electric and gasoline driven models. Let us send you the complete facts about the type you are interested in.

THE THEW SHOVEL CO. • LORAIN, OHIO

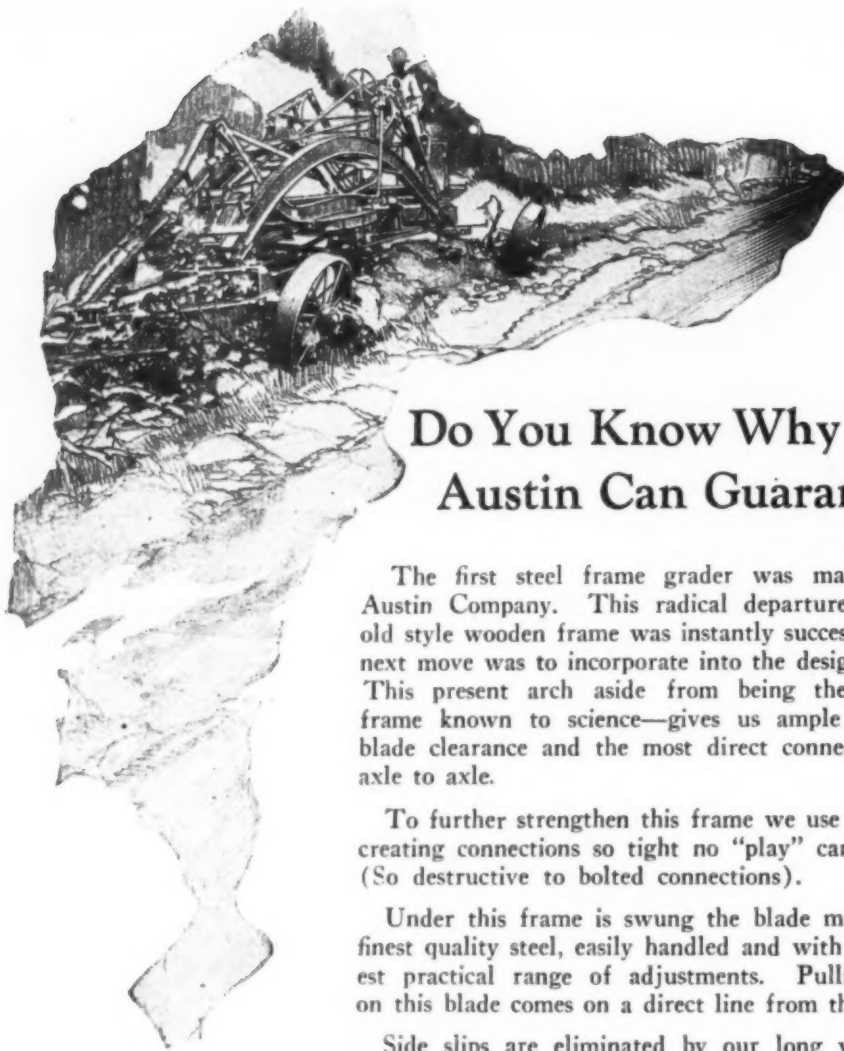


Gasoline, Steam and Electric  
SHOVELS CRANES DRAGLINES



**LORAIN 75**





## Do You Know Why Austin Can Guarantee Its Graders?

The first steel frame grader was made by the Austin Company. This radical departure from the old style wooden frame was instantly successful. The next move was to incorporate into the design an arch. This present arch aside from being the strongest frame known to science—gives us ample room for blade clearance and the most direct connection from axle to axle.

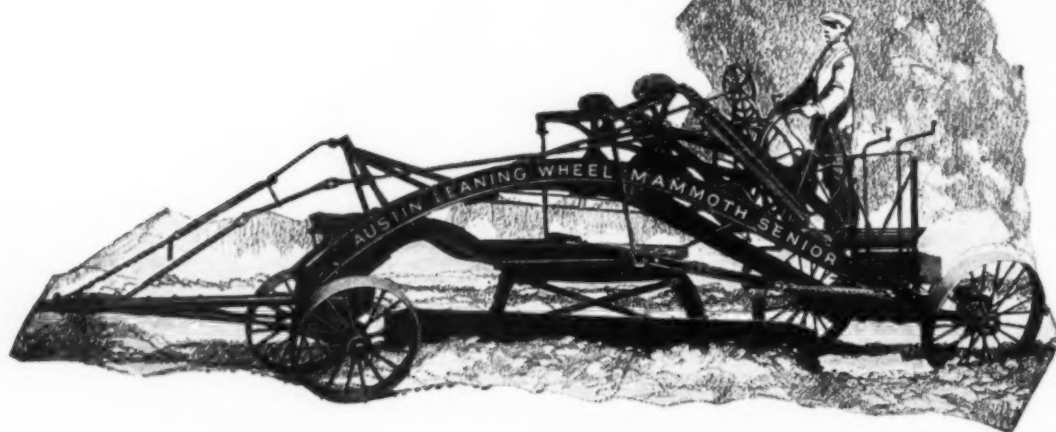
To further strengthen this frame we use hot rivets, creating connections so tight no "play" can creep in. (So destructive to bolted connections).

Under this frame is swung the blade made of the finest quality steel, easily handled and with the greatest practical range of adjustments. Pulling power on this blade comes on a direct line from the front.

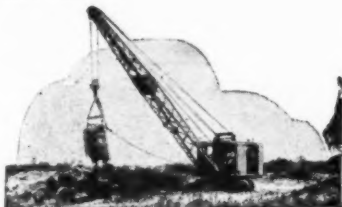
Side slips are eliminated by our long wheel base and our exceptionally heavy rear end. Here we find the feature of greatest importance to highway builders and road maintenance groups! **The only leaning wheels combined with a telescopic axle**—universally known as "The long and the short of it." Blade efficiency with no wheel interference.

Timken tapered bearings and Alemite lubrication are regular equipment in all Leaning Wheel models. Your assertion—"The most grader per dollar"—is the basis of our guarantee.

THE AUSTIN-WESTERN ROAD MACHINERY CO.  
400 N. Michigan Ave. Chicago, Ill.



Every Gas+Air ERIE Shovel or Crane can be quickly changed over for dragline work. The direct-connected swinging engines give *full swinging power* at the same time the dragline is being overhauled at *full power*. Perfect control.

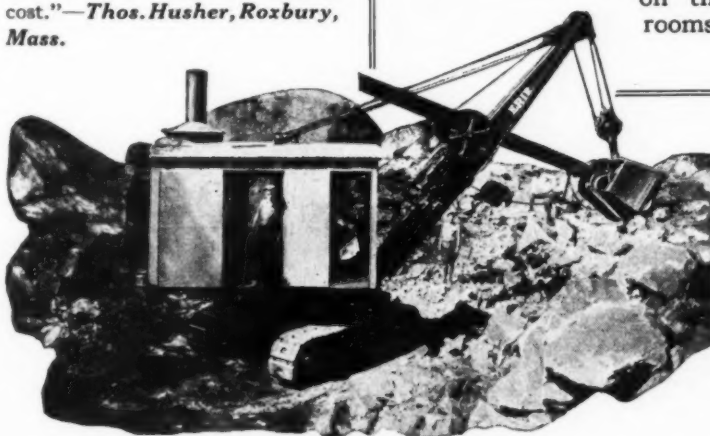


Rumsey & Jordan, Seattle, Wash., have used their Gas+Air ERIE both as shovel and dragline, and write:

"Our Gas+Air ERIE has been doing good work ever since we started it, running 18 hours a day—first as a dragline, handling loose rock and large boulders, and later as a shovel in solid rock excavation. The performance of the Gas+Air ERIE has been excellent—much better than we expected." (They also have 2 Steam ERIES.)

The kind of work done by Gas+Air ERIES is shown by the REPEAT ORDERS for these *direct drive* gas shovel-crane—now number 38% of first machines.

"ERIE turns out more yardage": "Have just taken out 13,000 cu. yds. of hardpan, and in my 20 years' experience have found no other shovel that will turn out the yardage that the ERIE does, and with such ease. The ERIE is the most reliable shovel, with very low upkeep cost."—*Thos. Husher, Roxbury, Mass.*



## "In the best regulated families,"

**Bill Muldoon says:**

"No hatchet-and-saw man is going to stick up a ten by twelve shack for *my* wife's home!" said Sammy Briggs.

She was a brand new wife then, married just a week. Sam got the best builder in Nason City to come thirty-five miles with a gang and tools and materials, and put up a little two-room bungalow that was a knockout.

"While you're at it, why don't you let them build you a five or six room house?" I asked Sam. "The railroad's going to bring a town right here, sure as shooting, and when you're all cleaned up on this contract you can sell at a good price."

But Sam was one of those fellows who can be open-fisted and economical at the same time. He built the two-room bungalow.

Next year the builder came down again from Nason City and added on three more rooms. It was

twins, and Mrs. Sam's mother and three sisters joined the family to help ride herd on 'em.

In cases like that you have got to wait until Nature takes its course—but a contractor is able to *look ahead* when he's buying a gasoline shovel.

You can see some future jobs coming where you'll need all the output of a real power shovel. Sometimes your shovel will have to compete with a fast modern steam machine—and you're going to be out of luck if yours is a friction drive rig.

So when you need gasoline power, bet on yourself! Get the *direct drive* gas shovel, that outdigs any other machine its size. The Gas+Air ERIE gives you the output. And it has the ERIE strength, so you can work double shift if it's twins you're trying to feed.

*Bill Muldoon.*

P. S.—When you're using your Gas+Air for clam or dragline work the extra speed is still there—the swing engines are always in gear. Snappier action and better control.

A dozen letters like those at the left would mean little—but the *thousands* of such reports in our files are convincing.

Contractors appreciate the bigger production and steadier service they get with Steam and Gas+Air ERIES. That's why there are more than 4,200 ERIES in service, far more revolving shovels and cranes than any other manufacturer has produced.

Write for Bulletin SM-80 (Steam)  
or Bulletin SM-82 (Gas+Air).

**ERIE STEAM SHOVEL CO., Erie, Pa., U. S. A.**

Branch Offices: Boston, New York, Philadelphia, Atlanta, Pittsburgh, Buffalo, Detroit, Chicago.  
Representatives throughout the U. S. A.

# GAS+AIR ERIE and Steam DREADNAUGHT

SHOVELS, CRANES, DRAGLINES, ETC.



STRENGTH WHERE NEEDED.  
THE ROUND TOP DOESN'T  
DENT EASILY. IT STAYS TRUE.  
CONCRETE CANNOT LODGE ON  
IT. IT'S SELF CLEANING

HIGH CARBON STEEL  
IS USED EXCLUSIVELY  
FOR CARR FORM  
STAKES. THEY ARE  
 $\frac{1}{4}$  INCH IN DIAMETER.

FOR STRENGTH, ALL  
CARR FORMS ARE  
MADE OF  $\frac{3}{16}$  INCH  
STEEL PLATE

THERE ARE 4 STAKE  
POCKETS FOR EACH  
12 FT. SECTION

FORMS ARE LOCKED  
TO STAKES BY A  
SIMPLE KEY WEDGE

THIS FLANGE GIVES  
ADDITIONAL STIFF-  
NESS TO THE FORM

ALL CARR FORMS  
HAVE A 6 INCH WIDE  
BASE FOR BETTER  
SUPPORT

FOR GREATEST  
STRENGTH, STAKE  
POCKETS ARE ELEC-  
TRICALLY WELDED IN  
PLACE



The Wedge Lock  
Joint holds the tops  
of the form sections  
in alignment under  
the concentrated  
load of the Finisher  
wheels.



12-foot sections  
save time and labor.

## The Round Top and Wedge Lock Joint

on the improved CARR FORM insure  
smoother road surface

# THE LAKEWOOD ENGINEERING COMPANY

*Paving & Construction Equipment*  
Cleveland, Ohio

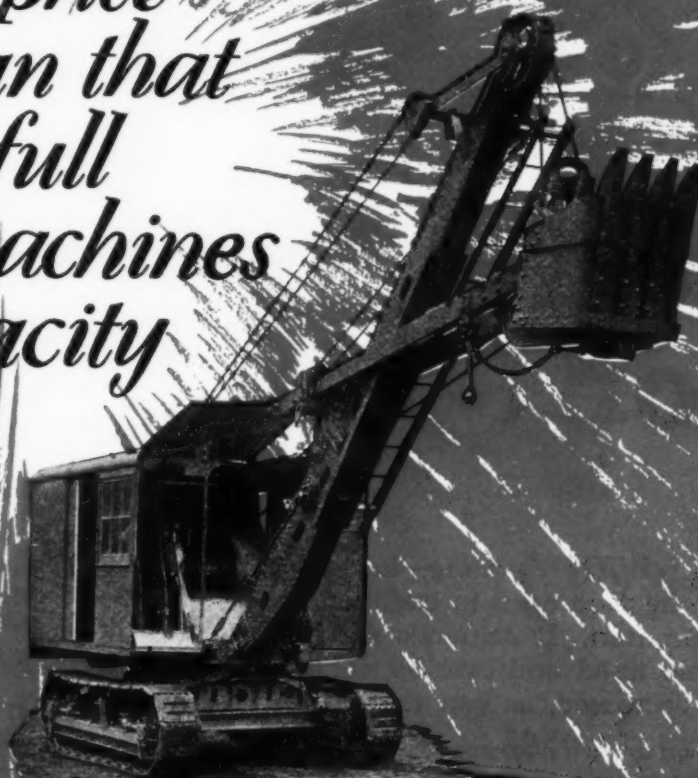
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30 Church St., New York City

Cable Address  
Brosites

The quality  
is the highest  
employed in shovel  
design and  
construction

NORTH  
WEST

*And the price  
is lower than that  
of other full  
revolving machines  
of its capacity*



Model 2  
1/2 Yard

Model 3  
3/4 Yard

Model 105  
1 Yard

Model 144  
1 1/2 Yard

Shovels - Cranes - Draglines

NORTHWEST ENGINEERING CO.

1723 Steger Bldg., 28 E. Jackson Blvd., Chicago, Ill., U. S. A.

The world's largest exclusive builders of gasoline, electric and Diesel  
powered shovels, cranes and draglines

**NORTHWEST**

**TRANSFORMABLE CONVERTIBLE and DRAGLINES**

*Gasoline · Diesel · Electric*

CHICAGO

# KOEHRING



Can  
your  
paver  
go on any job?

**HALF-WIDTH paving**—keeping half of the road open to traffic becomes more common. It demands a paver of adjustable tread and over-all width that can be decreased, as can the Koehring!

—when an **arched charging skip** is demanded to clear center joint, it's ready on a Koehring!

— when low bridges or wires must be cleared, the Koehring upper framework is quickly lowered!

The Koehring adapts itself to any job, and to any equipment!

**If you're using trucks**, the charging skip has liberal width for the biggest trucks — saves the time needed to back trucks to a precise position.

**If you're using batch boxes** — the Koehring power operated derrick is interchangeable to either side of the mixer. It hoists and swings by

power! One man at the levers, that's all! No men pushing the boxes! On any kind of job, with any hauling equipment, the Koehring is —

## THE FAST PAVING UNIT!

Fast charging! Fast in a re-mixing action that can't fail to deliver plastic quality concrete within mixing period, fast in discharging and distributing! Fast in ease of control that keeps batches going through the drum, one on the heels of another! Fast by the Batchmeter!

### SIZES

**Pavers**—7-E, 13-E, 27-E. Auxiliary equipment and choice of power to suit individual needs. Complies with A. G. C. Standards.

**Construction Mixers**—10-S, 14-S, 21-S, 28-S. Steam, gasoline or electric power. Mounted on trucks or skids. Rubber tired wheels optional. 28-S on skids only. Complies with A. G. C. Standards.

**Dandle Mixer**—5-S, 7-S—5-S single cylinder, 7-S two or four cylinder gasoline engine. Power charging skip, or low charging hopper and platform. Rubber tired steel disc wheels or steel rimmed wheels. Complies with A. G. C. Standards.

Write for Paver Catalog P-17



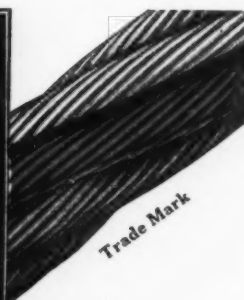
**KOEHRING COMPANY, MILWAUKEE, WISCONSIN**  
PAVERS, MIXERS—GASOLINE SHOVELS, CRANES AND DRAGLINES

Sales Offices and Service Warehouses in all principal cities  
Foreign Department, Room 1370, 50 Church Street, New York City  
Mexico, F. S. Lapum, Cinco De Mayo 21, Mexico, D. F.

A3875-1



Illustration shows night work on the Lake Pleasant Dam in Arizona. This project is being built by Carl Pleasant for the Maricopa County Municipal Water Conservation District No. 1. "HERCULES" (Red Strand) Wire Rope is on the job.



When completed this will be the highest and widest multiple arch dam in the world. It will be 250 ft. high and 1,975 ft. wide, and will form a lake 8 miles long and 2 miles wide. It will irrigate approximately 40,000 acres of land.

## "HERCULES" (Red Strand) Wire Rope

### *The Contractors' Choice for Rush Work*

When speed is essential, dependable wire rope is necessary, for when a rope fails the equipment on which it is used is temporarily out of business.

"HERCULES" (Red Strand) Wire Rope is dependable because it is made of acid steel wire, and every wire that goes into it is first rigidly tested by us to make sure that it meets our exacting requirements. Any wire lacking in any particular is rejected.

If you want wire rope that will keep your work on a safe, fast and economical basis, give "HERCULES" a chance to show you what it can do. Try it on your hardest work, and keep a record of its service.

Made Only By

**A. Leschen & Sons Rope Co.**

Established 1857

5909 Kennerly Avenue  
ST. LOUIS

New York

Chicago

Denver

San Francisco

# *It takes* **a HAISS** To handle "Cold Patch"

The City of Washington, D. C.—recently in the market for a Loader to pick up "cold patch" tar macadam at their mixing plant and load the street repair trucks—invited a demonstration of the abilities of various Loaders.

It is sufficient to say that it took a Haiss to do the job—and that a Haiss did the job so well that there was no question about it. The Haiss feeding device and slow speed crowding give the machine a digging ability which put it in a class by itself.

*Every man interested in truck loading  
should have our Loader Catalog.*

George Haiss Manufacturing  
Company, Incorporated  
139th Street and Rider Avenue, New York



What about the *next job* and next year?

Have you bought equipment that will last one job or one season or has it been built to stand the "gaff" year-in and year-out and is it the product of specialists? The perfected utility is not in the "one-job" or "one-season" class. It has 35 years' experience "in-built." Not an "accident" or "made-over" tool, but "engineered" by engineers from tread to roof. The GENERAL EXCAVATOR has made the most remarkable record known to the excavating machinery field — *built to serve, satisfy and survive*. It will still be giving service and earning profits for its owners when other machines sold for the same purpose are in the scrap pile.

A general purpose all-around tool, convertible in the field to Crane, Clamshell, Trencher, Skimmer, Shovel, Dragline or Back-Filler and without the use of mechanics or the addition of any operating machinery. Not a toy—weighs 17 tons, is full-revolving, built almost entirely of alloy steel castings, powerful, rugged, flexible and in addition to being the best in its class is also cheapest in the long run.

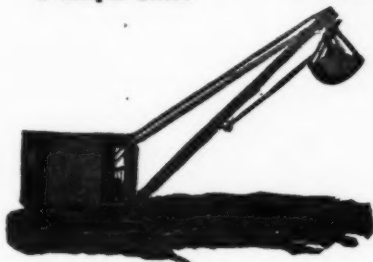
Enthusiastic users and discriminating engineers insist that it is the most economical and efficient half-yard combination power machine ever built. Over-size—overservice.

Guaranteed against defects in materials and workmanship for one year.

Distributors in  
Principal Cities

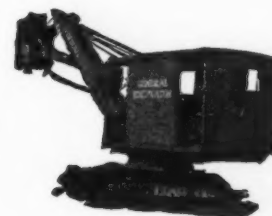
**The General Excavator Company**  
Marion, Ohio, U. S. A.

Bulletins and data  
on request



*The Product of Specialists*

*The Perfected Utility*





# Keep big business going big



When you have a lot of digging to do in a hurry

The powerful new Bucyrus 100-B is a utility shovel for heavy excavating. On all kinds of digging where ordinary shovels fail—on all jobs where big yardages are essential—this close-coupled, full-revolving digging tool keeps big business going big.

Swinging in a 16 foot radius, the 100-B works effectively in the closest of quarters. It digs with the punch and speed of the railroad type shovel, but has a wider digging and dumping range.

It has the famous Bucyrus outside dipper handles that crowd the dipper squarely into the bank for a heaping load at every

*The new Bucyrus 100-B 3-yard shovel has a full revolving swing—the speed of single truck caterpillar mobility, plus a big digging capacity*

pass. And its single-truck caterpillar mounting permits the 100-B to maneuver in and out of corners and around the job with virtually the same speed as a small revolving shovel.

Built as only Bucyrus can build, this shovel presents a sturdy, hard—digging tool for the contractor who does big things in a big way.

If you are interested in such a shovel, designed to wade through even the toughest rock, digging with the low costs that big yardages bring, write for bulletin D-1005-2. A post card brings it.

BUCYRUS COMPANY, South Milwaukee, Wisconsin

# BUCYRUS

NEW YORK

CHICAGO

BIRMINGHAM

SAN FRANCISCO

PITTSBURGH

TOKYO

LONDON



## A "Leyner" Drill Steel Sharpener should be included in every rock drilling outfit

The Size 34 Sharpener is portable and is particularly suitable for contract work where "Jackhamers" are used.

These small, lightweight machines will resharpen dulled bits or will quickly and cheaply make up new steels from bar stock.

Bits made in "Leyner" Sharpeners are true to size, shape, and gauge. The gauging blocks make it possible to reduce clearance between successive bits to  $1/16''$ . This alone greatly increases the daily footage.

The No. 34 produces a higher quality of bits than can be turned out by hand. Machine-made bits cut faster and last longer, thereby effecting large economies in labor, drill upkeep, and cost of steel.

There are 3 sizes of "Leyner" Sharpeners—one for each set of conditions. Ask for Bulletin No. 4322.



No. 34 Drill Steel Sharpener

INGERSOLL-RAND COMPANY, 11 BROADWAY, NEW YORK CITY  
 Offices in principal cities the world over  
 CANADIAN INGERSOLL-RAND CO., LIMITED, 10 PHILLIPS SQUARE, MONTREAL, QUEBEC.

137-LDS

# Ingersoll-Rand

# When it's Your Move

*Blaw-Knox Portable Batcherplants used for building the Bower Hill Road near Bridgeville, Pa.*



## BLAW-KNOX PRODUCTS

**Batcherplants for**  
Central mixing and proportioning.

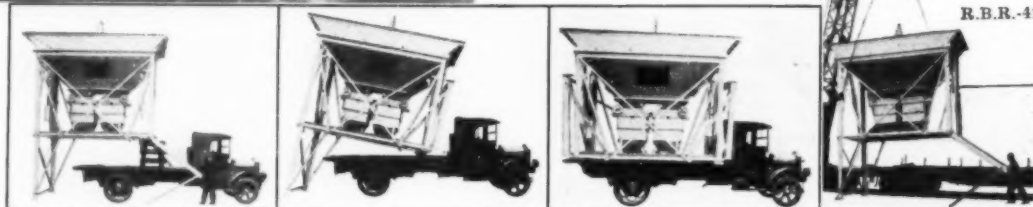
**Batchers for**  
Volume measuring weighing.

**Inundation System**

**Steel Forms for**  
Roads and Streets  
Sidewalks and Curbs  
General Construction.

**Clamshell Buckets**  
Calcium Chloride  
Machine

**Turntables**  
Steel Buildings  
Steel Grating



Quickly handled with or without a crane — the legs fold up

# BLAW-KNOX

You are fortunate if you have a Blaw-Knox Portable Batcherplant—for you can move this bin quickly without the loss of a bolt.

Simply fold up the hinged legs, load the entire bin onto a truck—and the bin starts for its new location.

Besides, this bin is absolutely self-cleaning. Steep sides—no bolts or ledges to obstruct flow of materials.

When this bin reaches the job it arrives complete with measuring equipment attached—Blaw-Knox Volume Batcher, Weighing Batcher or an Inundator for making constant concrete by the Blaw-Knox Inundation System.

*Write for prices and information on  
Blaw-Knox Portable Batcherplants*

## BLAW-KNOX COMPANY

686 Farmers Bank Building, Pittsburgh, Pa.

New York  
Buffalo

Detroit  
Chicago

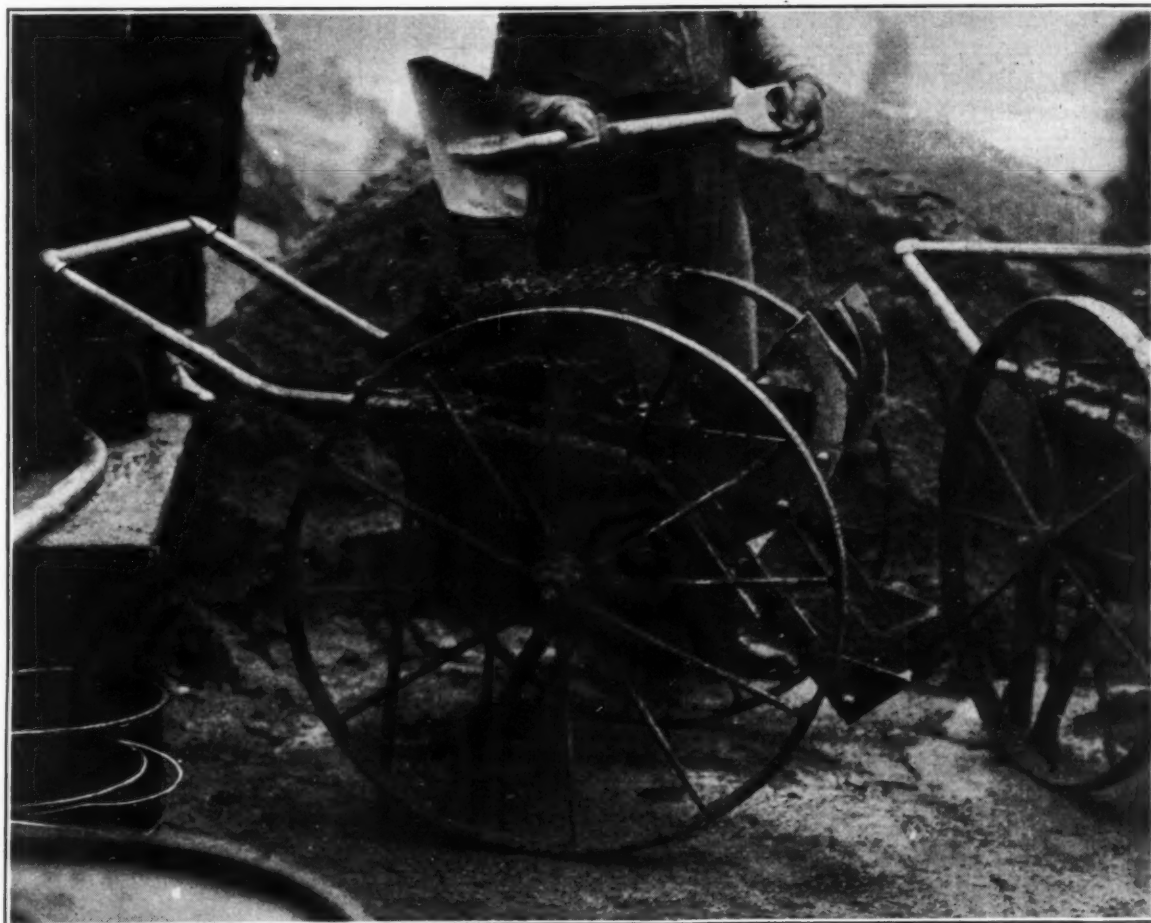
Philadelphia  
Birmingham

Cleveland  
Baltimore



# Carrying out the Water-Cement Ratio Theory

Instead of a wheelbarrow for sand — use a Blaw-Knox Junior Inundator.



## —for Control of Concrete on the Small Job

The Strength of concrete is primarily dependent on the control of water in each batch, provided the mix is workable.

The contractor who wants an easy and positive way to produce constant concrete will find the answer to his problems in the Blaw-Knox Junior Inundator.

It requires no change in the rest of the equipment on the job.

For the small wheelbarrow job the Blaw-Knox Junior Inundator has been developed to *measure* sand and water—to automatically compensate for the variable moisture in the sand—and at the same time it auto-

matically eliminates a further variable by compensating for the bulking of the moist sand, thus making the mix workable.

Instead of a wheelbarrow for sand—use a Blaw-Knox Junior Inundator and overcome the bulking which is prevalent in all commercial sand.

It prevents waste of cement—and eliminates all guesswork and troublesome tests for moisture content or bulking of the sand. It saves inspection troubles and prevents friction and delays on the job.

Contractors and engineers value and endorse the Blaw-Knox Inundation System as the only real means of obtaining uniform strength concrete through control of water and sand.

*We are pleased to offer this handy INUNDATOR to contractors at a price surprisingly low. Further information will gladly be sent upon request.*

### BLAW-KNOX COMPANY

686 Farmers Bank Building, Pittsburgh, Pa.

New York Philadelphia Chicago Detroit Birmingham Buffalo Baltimore Cleveland

RI-132

# BLAW-KNOX



BLAW-KNOX BUCKETS - DEPENDABLE - POWERFUL - LASTING

ROAD BUILDERS' EQUIPMENT—STEEL FORMS FOR CONCRETE—FORGE & HAMMER WELDING  
STEEL GRATING—CLAMSHELL BUCKETS—STANDARD BUILDINGS—STEEL BINS  
STEEL PLANT EQUIPMENT—TRANSMISSION TOWERS





# Ready-

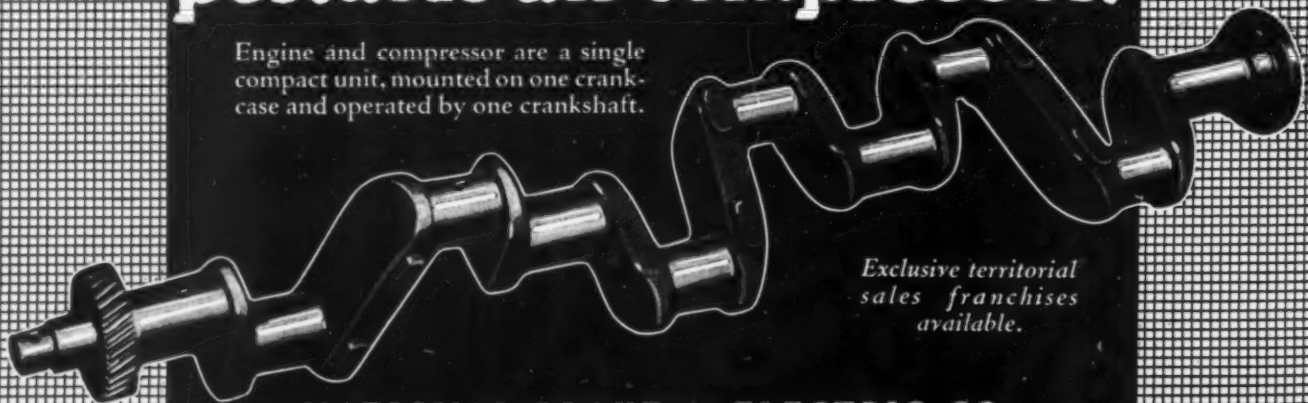
National Air Compressors are built in 110, 160, 240 and 330 cu. ft. sizes; standard mountings.

## a unit principle

# National

## gasoline engine-driven portable air compressor.

Engine and compressor are a single compact unit, mounted on one crankcase and operated by one crankshaft.



Exclusive territorial  
sales franchises  
available.

NATIONAL BRAKE & ELECTRIC CO.

Division of Westinghouse Air Brake Co.  
MILWAUKEE, WIS.



## PORTABLE CONVEYORS

FOR LOOSE AND BULK MATERIALS



PORTABLE MACHINERY COMPANY, CLIFTON, N.J.

# Send for this New Catalog

**A** GUIDE for selecting the most efficient Conveyor for the Particular Requirement. Seven standard Types—More than Fifty standard Sizes—Numerous Permanent and Semi-permanent installations.

**H**UNDREDS of illustrations tell thousand word stories at a glance. Handling everything from Coal to Bananas. Several pages illustrate standard Conveyors with various additions which have successfully solved many problems.

**Y**OU will find things of great interest and profit to you in this New Catalog—Cheerfully sent on request.

Ask for Catalog 527—Use Coupon Below.

**Portable Machinery Company**  
Lakeview Ave., Clifton, N.J.



Freight Type Conveyor



CLEARANCE DIMENSIONS: (SEE PAGE 12)

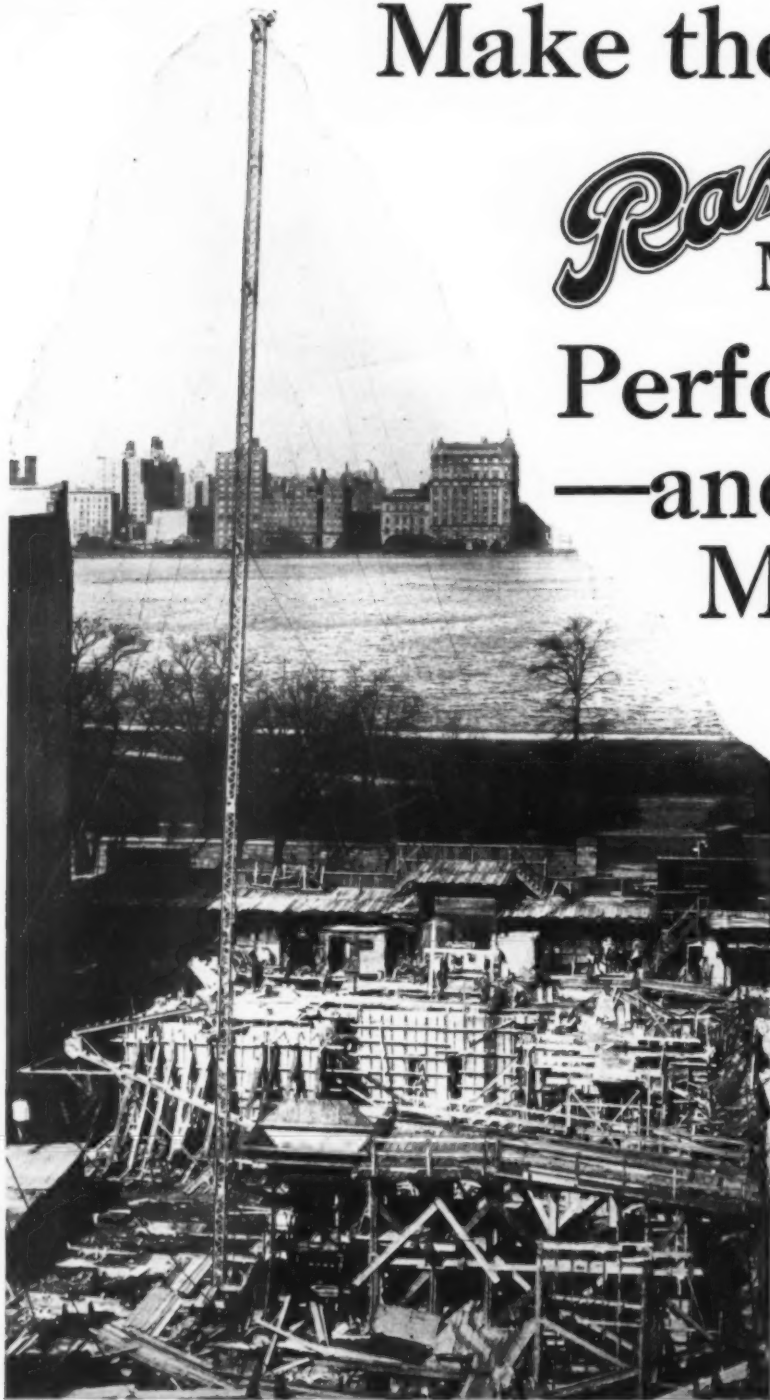
Original Scoop Conveyor



CLEARANCE DIMENSIONS: (SEE PAGE 12)

Portable Machinery Co., Clifton, N. J.  
Please send your New Catalog 527 on PORTABLE CONVEYORS.  
Name \_\_\_\_\_ Address \_\_\_\_\_ Position \_\_\_\_\_ State \_\_\_\_\_





Church of the Heavenly Rest—  
New York City—a \$2,000,000 Job.

All day long, this 150 ft. high "Monkey" takes its half yard load from a Ransome 14-S Mixer, climbs the steel mast and delivers the concrete to a long chute.

Three Ransome Mixers—a 14-S and two 7-S

Mixers are used by Thos. O'Reilly & Son, Inc.—an all Ransome job.

The Ransome Monkey-on-a-Stick is easily and quickly erected and is low in price. Saves a lot of money for progressive builders.

Write for Bulletin 115-A

Ransome Concrete Machinery Co., Dunellen, New Jersey

# Make the *Ransome* Monkey-on-a-Stick Perform —and Save Money

## RANSOME DOMESTIC REPRESENTATIVES

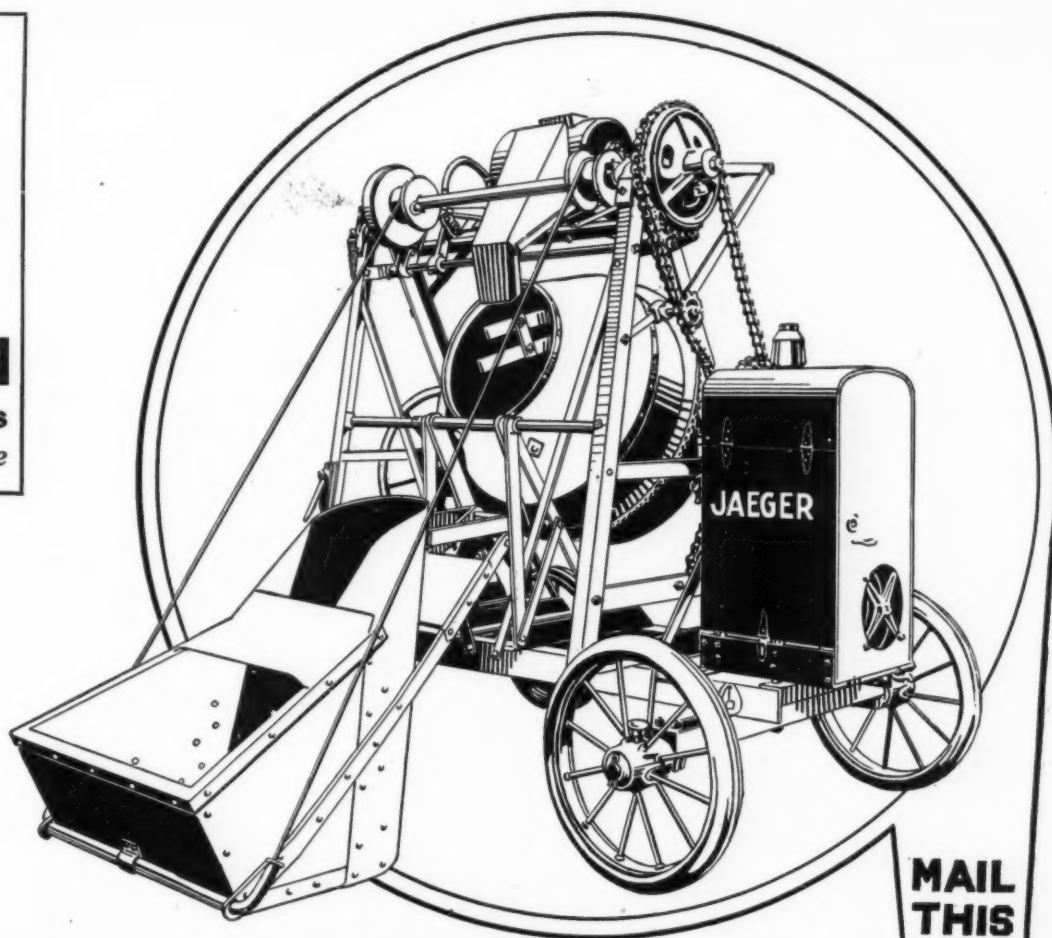
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R. C. Equipment Co.



# *Ransome Monkey-on-a-Stick*



**TIMKEN**  
Roller Bearings  
---last a lifetime



## JAEGER'S TIMKEN BEARING LIGHT ONE BAG TILTER

*—at the usual half bag price*

**DEPENDABILITY**, that's why Jaeger is the world's largest selling line of mixers—We try to eliminate break downs by using steel and forgings—semi-steel gears—Timken bearings—saving weight yet 50% stronger.

**SPEED**, Jaeger Patd. "Flat Spot" Drum discharges batch clean in 5 seconds—mixes better—easy automatic discharge—fast accurate measure water tank—automatic skip shaker. Get more batches a day with Jaegers.

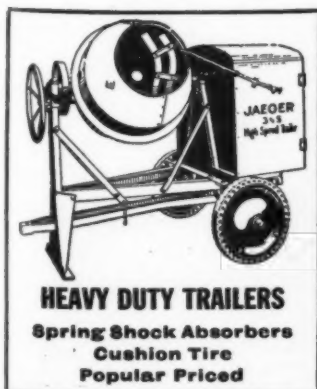
### THE JAEGER MACHINE COMPANY

800 DUBLIN AVE.

COLUMBUS, OHIO

Over 100 Jaeger service stations, distributors and branches are located in all principal cities—no delays—standardize on Jaeger and profit by our quick service.

**MAIL  
THIS  
SLIP  
TODAY  
—  
FOR  
PRICE  
AND  
EASY  
TERMS**



**WRITE  
FOR NEW  
CATALOG**  
TILTERS  
3 1/2 TO 14 FT.  
NON-TILERS  
7 TO 26 FT.  
PLASTER  
MIXERS  
PLACING  
PLANTS

THE JAEGER MACHINE CO.,

800 Dublin Ave., Columbus, O.

Date.....

Please send catalog, prices and terms on:

☐ Non-Tilt Mixers ☐ Tilting Mixers ☐ Plaster Mixers

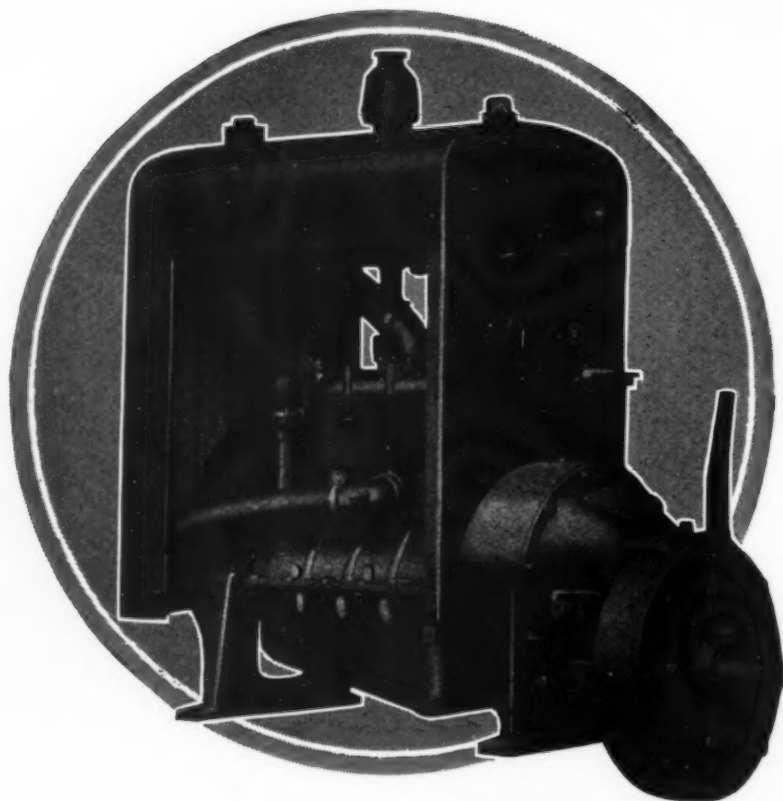
Size wanted .....

Name .....

Address .....

City .....

State .....



## **3 to 160 H.P.**

Think of this wide range of power — available in numerous sizes. Ample and dependable to serve all construction equipment. Nowhere will you get more able—more economical engines. And now that Beaver Engines are made by Le Roi — no power assignment is too heavy or too light.

**LE ROI COMPANY, Milwaukee, Wis.**

**ENGINE BUILDERS *only!***

# **LE ROI ENGINES**

**NOW RANGE FROM 3 TO 160 HORSE-POWER**

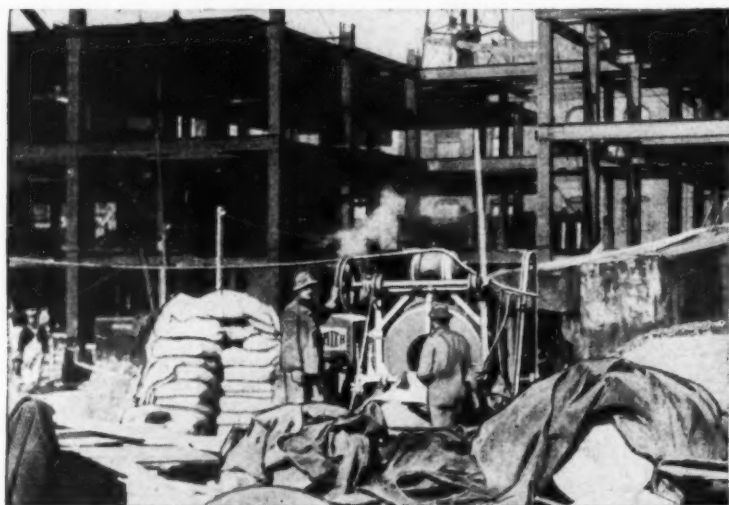


# The Most Successful Contractors

The smile of satisfaction that goes with a profitable business

**J**OBS done on time—concrete poured without delay—these are necessary for greater profits in the contracting business.

Many contractors are yearly making greater gains—handling more business and yet seem to do it easier



One of the Smith 7-S (One Bag) Mixers used in the construction of Tudor City by the Fred F. French Company, New York. This new housing development is in the heart of New York City between 40th and 43rd Sts., east of Second Ave. The French Co. demolished three square blocks of tenements to erect these safe, modern buildings.

The answer is—dependable equipment—as necessary on the construction job as in the efficient manufacturing plant.

Smith's quarter-of-a-century experience has been the means of constantly improving Smith Mixers.

The result—long life—greater output—fewer delays—three reasons for greater profit to the user.

How about your own equipment? Do you want to free yourself of annoying details? Do you want more time to look after new business?

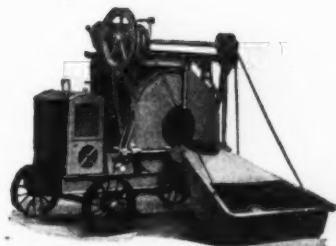
Dependable Smith Mixers are doing this for others. Pick out the size you need now and make this year a better year. Get our complete Catalog No. 526 now—the coupon reminder below is for your convenience, use it today.

## The T. L. SMITH COMPANY

1084 32nd Street, Milwaukee, Wis.

Sales Offices and Service Stations in Principal Cities

Smith Tilting Mixers are built in the following sizes: 2½, 3½, 5, 7, 10, 14, 21, 28, 40, 56 and 112 cu. ft. per batch; Smith Non-Tilting Mixers: 5, 7, 10, 14, 21 and 28 cu. ft. per batch; Smith Paving Mixers: 27-E.



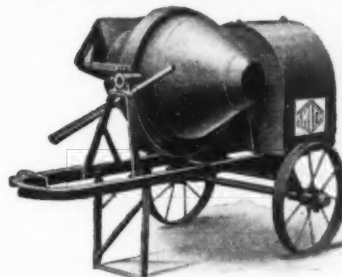
SMITH 7-S NON-TILTING MIXER WITH POWER LOADER

One bag capacity 1-3-6. This is the latest model of one of the most popular building mixers of the Smith line.



THE SMITH 3½-S TILTING MIXER WITH POWER LOADER

The second size in the Smith line, the 3½-S Tilter, is designed to produce 35 to 50 cu. yds. of concrete daily.



THE SMITH MASCOT

The Smith Mascot 2½-S Tilter is ideal for the small job and repair contractor who expects to place 25 to 40 cu. yds. of concrete per day.



1084

# SMITH MIXERS

THE T. L. SMITH COMPANY  
Milwaukee, Wisconsin  
Please send me a copy of your Mixer Catalog No. 526  
We are especially interested in a (Size of mixer)

Date.....  
Name..... Address..... City..... State.....

# MEETING UNUSUAL CONDITIONS

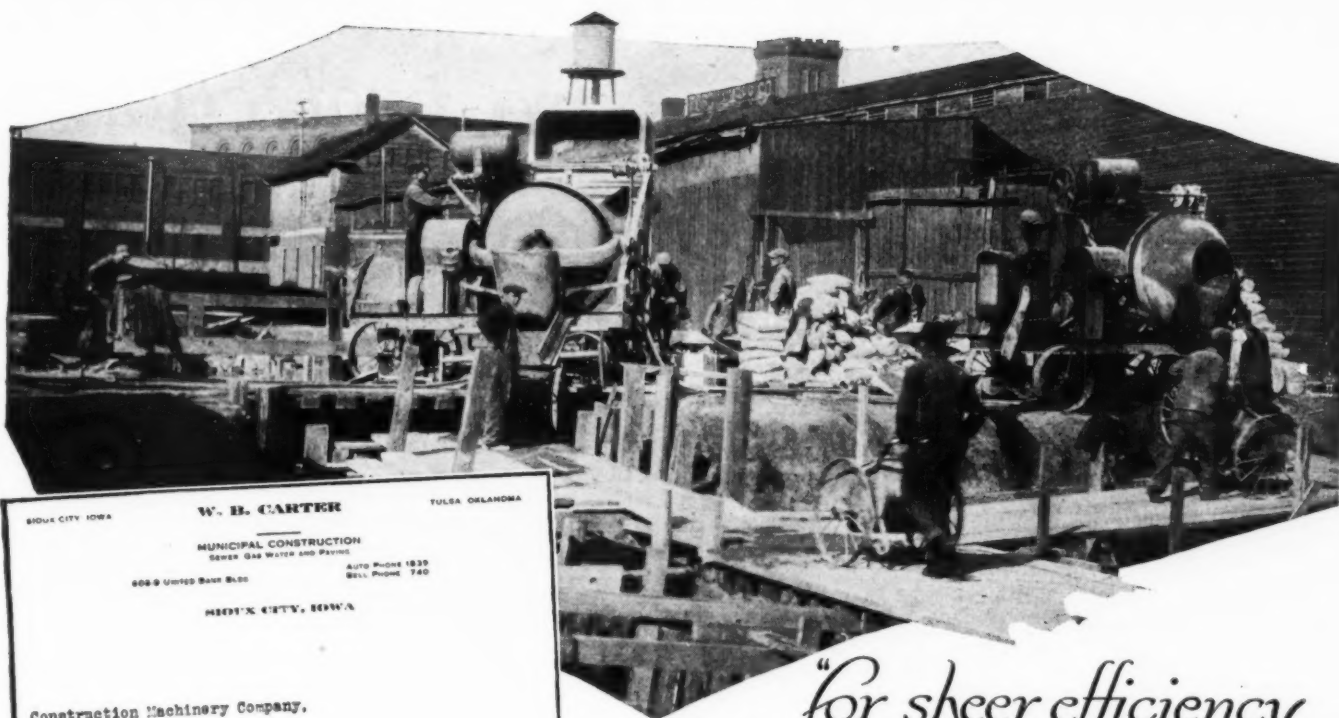
**T**HESE two Insley Steel Derricks are being used by Boya-john and Barr, Columbus, Ohio, for handling all the concrete, stone and other materials going into the new Columbus City Hall building. They are 5-ton stiffleg derricks with sills, each one having 110-foot boom and 40-foot mast, and are built for regular and clamshell work. They are special derricks, especially built to handle comparatively light loads over wide areas with speed and accuracy.

Insley Engineers have a fund of useful information and experience which enables them to design and build good equipment to meet any concrete placing, hoisting or material handling problem. Information on standard or special Insley concrete handling equipment, steel derricks or gantries, showing the application of this equipment to your work, is available for the asking.



**INSLEY** MANUFACTURING  
COMPANY - Indianapolis

Number 519  
*Engineers  
and  
Manufacturers*



SIoux CITY, IOWA

W. B. CARTER

TULSA, OKLAHOMA

MUNICIPAL CONSTRUCTION

SEWER GAS WATER AND PAVING

608-9 UNITED BANK BLDG

AUTO PHONE 1839  
BELL PHONE 740

SIoux CITY, IOWA

Construction Machinery Company,  
Waterloo, Iowa.

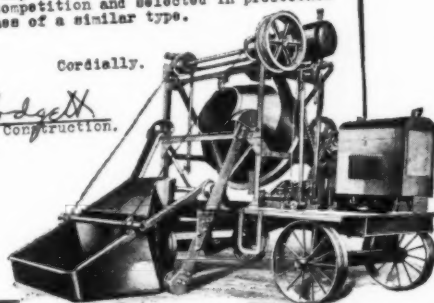
Gentlemen:

You might be pleased to know how we feel regarding the two Wonder "14" Mixers recently purchased from you for work on the Perry Creek Conduit, Sioux City's outstanding municipal project in recent years, and it gives me pleasure to express my keen appreciation of their true worth.

For sheer efficiency and economy of operation your Wonder Mixers have lived up to all the promises that have been made for them. It may also interest you to know they were purchased in competition and selected in preference to all other machines of a similar type.

Cordially,

*R. N. Bledsoe*  
Superintendent of Construction.  
W. B. CARTER



### Construction Details Perry Creek Conduit

20 ft. high, 42 ft. wide, 1430 ft. long.

Will carry 15,000 cu. ft. or 120,000 gal. water per second at flood times.

Total cost, \$810,000.00.

220 cars granite rock.

140 cars sand.

70 cars cement.

15 cars of reinforcing steel.

16 cars piling.

*"for sheer efficiency  
and economy of operation"*  
— WONDER "14"

**A** GAIN, Wonder is the mixer on the big job as well as the small. The above illustration shows two **WONDER "14"** mixers, used by W. B. Carter, contractor, in pouring the Perry Creek conduit now under construction in Sioux City.

The condensed specifications at the left will give some idea of the size of this municipal project.

Then read over Mr. Carter's letter of endorsement—what more can he say than that these mixers are living up to all the promises made for them.

Sixteen years of building Wonders—perfecting the original single opening, tilting mixer, has enabled us to offer the contractor the outstanding mixer value of all time.

**CONSTRUCTION MACHINERY COMPANY, WATERLOO, IOWA**

*Founders of the Single Opening Tilting Mixing Industry*



# At every curve...every intersection, we install this extra protection

"**W**E specify expansion joints in all our concrete construction," said Knox T. Thomas, prominent Consulting Engineer at Atlanta, Ga. "Just look over these photographs and note how well the joints have preserved our concrete.

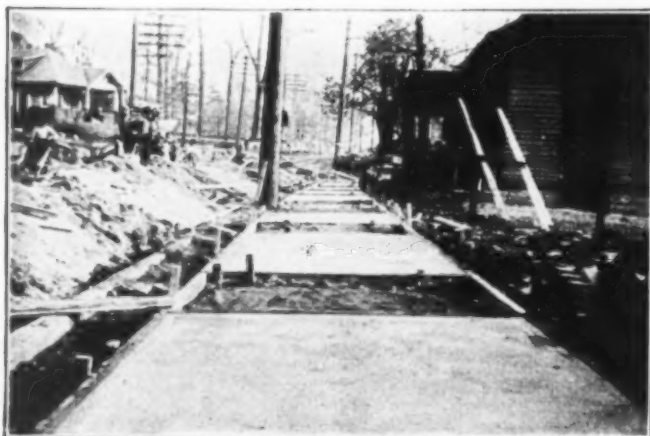
"We've found that it pays to provide special protection at all curves or breaks in the street or sidewalk. At every driveway, for example, we extend an extra joint around the circle, along the outer edge of the curb. This supplements our longitudinal joint, which separates the curb from the paving, and protects the triangular segments at the corners of the drive.

"Whether or not engineers now appreciate the economy of expansion joints—whether or not they are convinced, at present, of the lasting protection such joints afford—they've got to come around to that fact sooner or later. For the use of expansion joints is the logical, unfailing way to extend the life of concrete and to protect the professional reputation of the construction engineer."

*Carey Elastite Expansion Joint has been used extensively in Atlanta, as well as in hundreds of other cities throughout the United States. Mr. Thomas is but one of the country's leading engineers who recognize in it an ideal means of guarding against overstresses in concrete pavements. Our 72-page booklet will tell you all about Carey Elastite Expansion Joint—how to install it and how effectively it will protect concrete construction work. Write today for a copy. It's free.*



Mr. Knox T. Thomas, prominent Consulting Engineer of Atlanta, Ga. Mr. Thomas' thorough knowledge of concrete construction work has brought him merited recognition throughout the South.

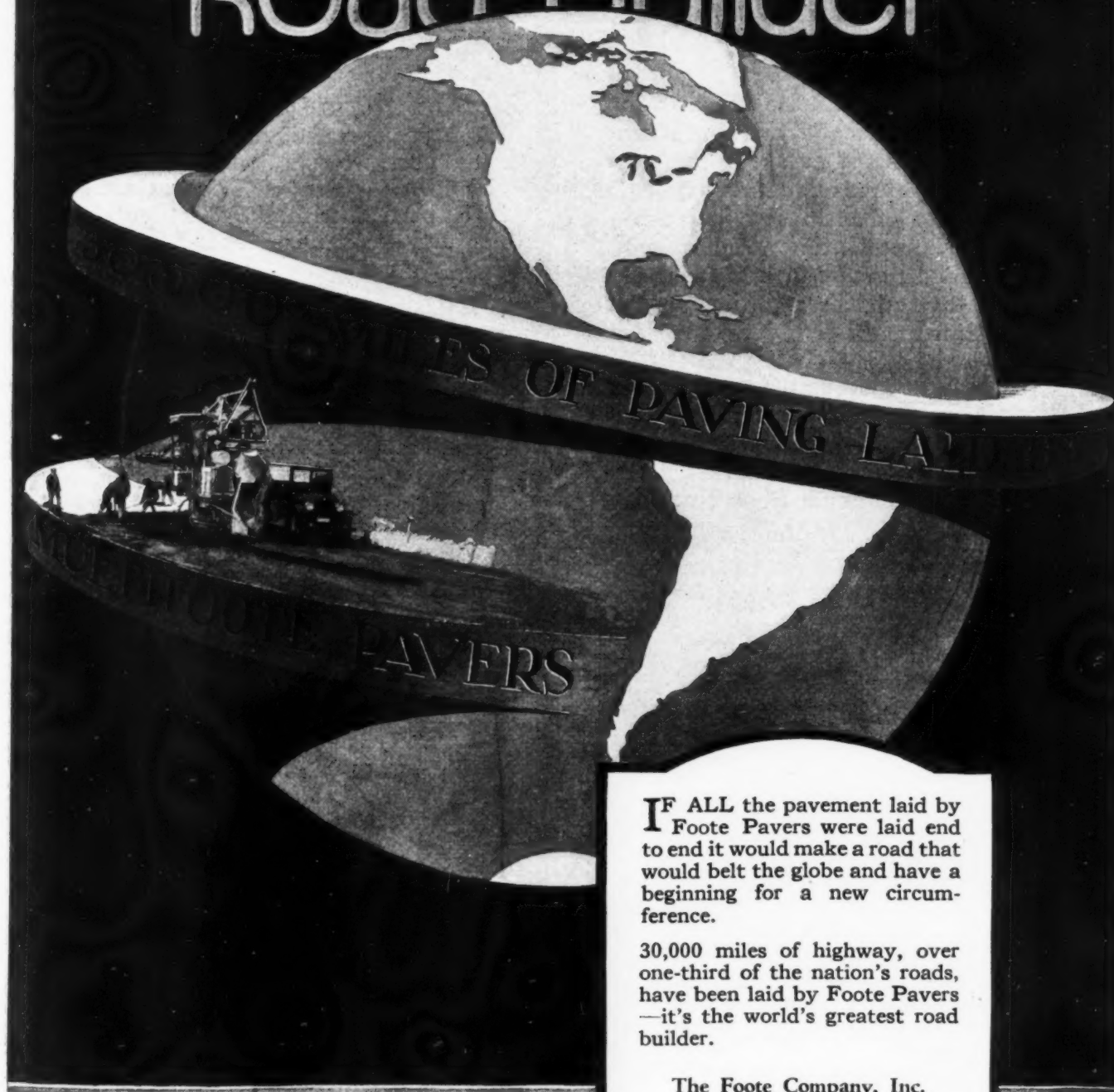


A section of sidewalk being installed at Marietta, Ga. Note how Mr. Thomas alternates the blocks in laying the concrete, a further proof of the importance he attaches to the use of Carey Elastite Expansion Joints.

THE PHILIP CAREY COMPANY  
Lockland, Cincinnati, O.

**Carey Elastite**  
EXPANSION JOINT

# the world's greatest Road Builder



**I**F ALL the pavement laid by Foote Pavers were laid end to end it would make a road that would belt the globe and have a beginning for a new circumference.

30,000 miles of highway, over one-third of the nation's roads, have been laid by Foote Pavers—it's the world's greatest road builder.

The Foote Company, Inc.  
of Nunda, N. Y.

*The world's largest exclusive builders of road pavers*

**MULTIFOOTE**  
*The Paver with Broken Bearings*

Frank E. Hall  
152 W. 42nd Street  
New York, N. Y.

Wileox Brothers, Inc.  
588 Chenango Street  
Binghamton, N. Y.

E. J. McHarg & Company  
31 Crestmont Road  
Binghamton, N. Y.

Multifoote Sales Company  
2811 West Fulton Street  
Chicago, Illinois

Burton Franklin  
Volunteer Building  
Chattanooga, Tennessee

Edward R. Bacon Company  
Folsom at 17th Street  
San Francisco, Calif.

# This Pair Gives Big Yardage

**W**HEREVER Link-Belt "Built for Service" Crawlers are used, you will hear of everyday performance that sounds like a record: 8000 lineal feet of 14-ft. sewer trench—dug in six weeks time; 6000 cu. yds. of porous rock—dug in four weeks time—five months of operation, but \$6.00 for repairs—

We will be glad to tell you more of what users think of the Link-Belt Crawler, and of the design which makes possible these remarkable performances. Ask for Book No. 895.



**S**AVING \$35.00 to over a \$100.00 per operating day is just one of the good reasons why owners of Link-Belt "Grizzly" Loaders are so well pleased with the machine that Crawls—as it Digs—as it Loads.

For accurate batching of materials the "Grizzly" has no equal—in sand and gravel pits, trucks are kept on the move because the interrupted screw feeder fills the buckets heaping full—in short

The "Grizzly" will serve your material handling needs at a saving unapproached by any other machine—write for Book No. 924.



## LINK-BELT COMPANY

Leading Manufacturers of Elevating, Conveying, and Power Transmission Chains and Machinery

CHICAGO, 300 W. Pershing Road

INDIANAPOLIS, 200 S. Belmont Ave.

PHILADELPHIA, 2045 Hunting Park Ave.

# LINK-BELT

## Shovels and Loaders



# One Inexpensive Device for Dozens of Jobs

Send the coupon below for more information about this little device. Handy-Andy is the Pulling Jack of all trades. Contractors, street repair departments, water departments, mines, oil producers, refiners, gas companies, light and power companies, drainage boards, factories, dredging companies, road builders—all find him a time and labor saver on scores of jobs.

**10 to 40 tons  
line pull**

Handy-Andy is portable, compact and light. Works on a ratchet principle like a lifting jack. One man with Handy-

Andy Jack replaces gangs of men on many jobs and saves tying up big, expensive equipment. Simple to operate, little to get out of order. Pays for itself in a very short time.

## Spot Cars



ONE man with Handy-Andy spots cars faster than several men with bars. Moves transfer cars, coal cars, gondola cars, and freight cars.

Besides the uses illustrated here Handy-Andy is used also for binding pile clusters, installing culverts, demolition and wrecking, moving houses and tanks, sinking and pulling well casing, pulling bridge floors, setting big valves and meters, pulling old piling, loading and unloading heavy machinery, dock and bridge construction, etc.

**Pull Trees and Small Stumps**  
Parks development contractors, road builders—all find Handy-Andy a money saver on this kind of work.



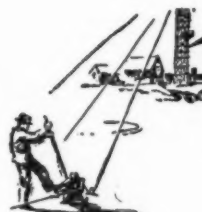
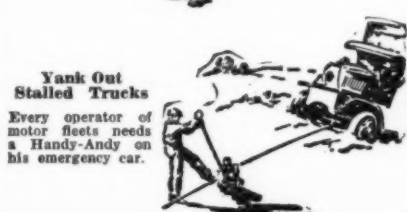
**Pull Sheet Piling**  
After the crane has gone use Handy-Andy to yank out the sheet piling. Pulls all kinds of piling.



**Hoist Heavy Towers**  
Handy-Andy enables the operator to hoist heavy towers with perfect control over them at all times.



**Move Heavy Machinery**  
Factories, contractors and riggers find Handy-Andy an invaluable piece of equipment for this work because of its tremendous capacity.



**Tighten Guy Lines Easily**  
This powerful little tool insures rigidly tight guy lines and cables on aerial tramways with a few ratchet movements of the handle.



**String Transmission Wires**  
An invaluable tool for tightening all kinds of lines on line construction and in overhead departments.

**Yank Out Stalled Trucks**  
Every operator of motor fleets needs a Handy-Andy on his emergency car.



**Pulling Pipe and Closing-up Pipe Sections**  
Handy-Andy is just the tool for pulling used pipe and closing up aqueduct and heavy pipe sections.



**For Conduit Work**  
Because of its compact size and shape Handy-Andy can be used in inaccessible places. The tool for pulling out and replacing grounded cable.

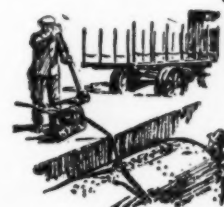


**Pull Heavy Forms Quickly**

Handy-Andy is a convenient, powerful, compact tool for form removal on all classes of work in crowded quarters.



**Move Barges Easily**  
No need to tie up other expensive equipment moving heavy barges into slips or to unloading shovels.



**Move and Set Boilers**

The automatic reverse on Handy-Andy makes it possible to have absolute control of heavy equipment when lowering.



Reg. U. S. Patent Office

# HANDY-ANDY

**Junior PULLING Jack**

Manufactured by  
**JOHN WALDRON CORPORATION**  
New Brunswick, N. J.  
(Est. 1927)

John Waldron Corporation, New Brunswick, N. J.  
Please send me prices of Handy-Andy Pulling Jack and  
bulletin showing rigging.

I am interested in using it for.....

Name .....

Firm .....

Address .....



Trailer Bins



Sectional Bins



Agrabatchers



Road Forms



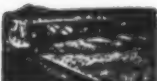
Curb and Gutter



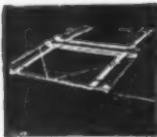
Sidewalk Forms



Joint Machines



Finishing Machines



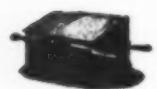
Traveling Bridges



Car Unloaders



Mixing Boxes



Tool Boxes

RIVETS  
FOUR  
TIMES  
AS  
STRONG

EXTRA  
RAIL FLANGE  
ADDS 20%  
TO  
STRENGTH

NO  
POSSIBLE  
JOINT  
DEFLECTION

STAKES  
6" APART  
CENTER  
TO  
CENTER

CONCRETE  
CAN'T FLOW  
INTO  
LOCKING  
DEVICE

LOCK  
JOINT  
10"  
LONG

NOTHING  
BOLTED OR  
RIVETED TO  
ROAD RAIL

MOVED  
AHEAD AS  
ASSEMBLED  
UNIT

Locate  
Stake Pockets  
Where  
You Need  
Them

CAN BE  
USED ON  
CURVES OF  
135 FOOT  
RADIUS

RAILS  
STEEL PLATE  
3-16" THICK  
4" or 6"  
BASE

Suspended  
On Stakes  
Will Support  
Dead Weight  
of 6000  
Pounds

## A Dozen "Whys" For Better Service

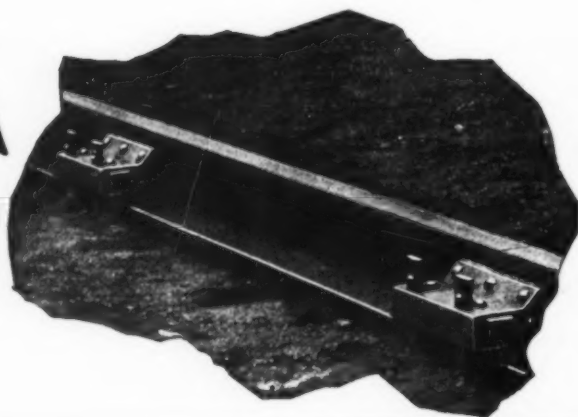
Any paving job, which evidences expert and efficient handling, is a credit and satisfaction to the contractor in charge.

And it is an established fact that the efficiency of the road forms used is reflected in the road surface.

Above are twelve good reasons why HELTZEL "Armor Plate" Steel Road Forms make possible road paving of the highest character.

They are built for greatest possible strength, maximum rigidity, absolutely firm anchorage, ease in handling unequaled, utility and alignment so perfect that they have earned the approval of state and county engineers the country over.

And it is gratifying to know your job has not only been done the best way but also the most economically.



The HELTZEL Road Form Catalogue points out many reasons why HELTZEL Forms will save you money on your road work. Copy sent without cost or obligation. Write for it.

THE HELTZEL STEEL FORM & IRON CO., WARREN, OHIO

# HELTZEL



# 35,000 Lbs.



## *Experience Built This Shovel*

**T**HE Bear Cat has been built up from 24,000 lbs. to 35,000 lbs. in the last three years. Why? Because our wide experience has shown that most contractors and engineers demand a machine that is heavy enough to stand up under severe work.

The Shovel dipper has behind it 17 tons of weight and power and takes a full half yard in hard digging.

The Bear Cat is fast, with every attachment. It is economical. It will save you money.

Interchangeable Attachments



Send the coupon today for full information.  
We can make immediate delivery now.

BYERS MACHINE CO., Ravenna, Ohio  
Sales and Service Throughout the Country

# BYERS BEAR CAT

THE ALL-PURPOSE ONE MAN CRANE-SHOVEL-DITCHER

BYERS MACHINE CO.  
Gentlemen—  
Please send me the new Bear Cat Book.  
of work I am particularly interested in is \_\_\_\_\_ The type \_\_\_\_\_  
Name \_\_\_\_\_ Address \_\_\_\_\_ Town \_\_\_\_\_ State \_\_\_\_\_ C. M. \_\_\_\_\_  
C. M. \_\_\_\_\_

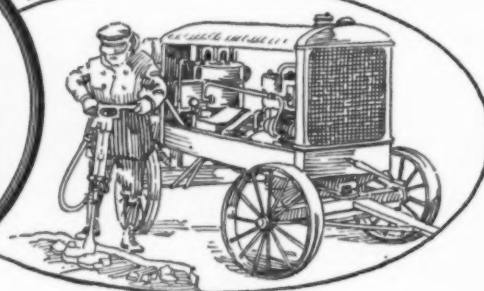
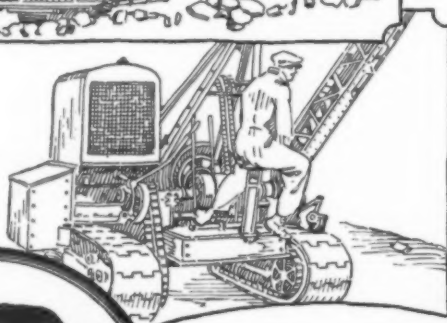
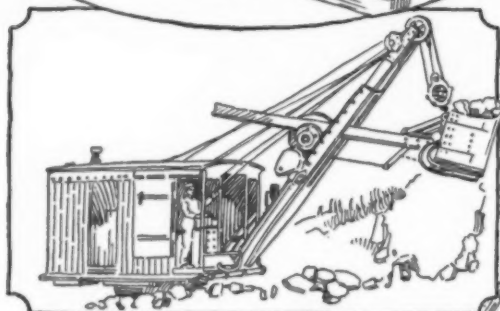
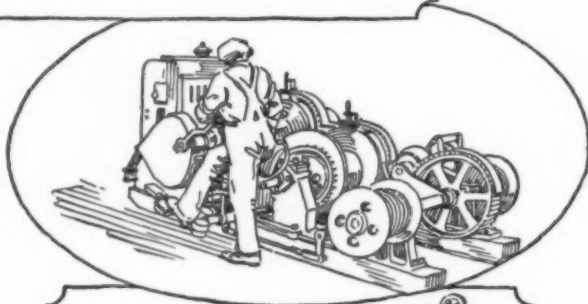
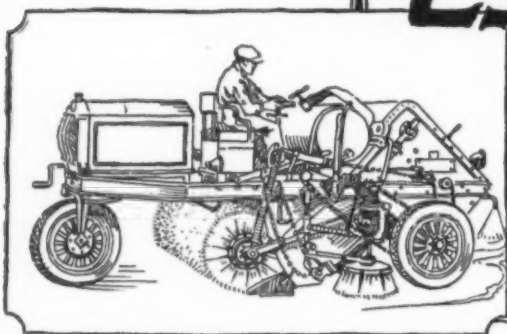


# *Continental*

## POWER UNITS

~are

## Eisemann Equipped



IT is not by chance, or accident, that EISEMANN ignition is used on CONTINENTAL industrial engines.

The selection of EISEMANN is the outcome of thorough study in the great CONTINENTAL Laboratories—supplemented by actual field tests extending over a long period of time.

All makes and types of ignition were minutely examined and compared. Nothing was left undone to determine the best ignition equipment for CONTINENTAL Power Units.

Severe "Break Down" tests reveal the superior qualities of EISEMANN Magneto.

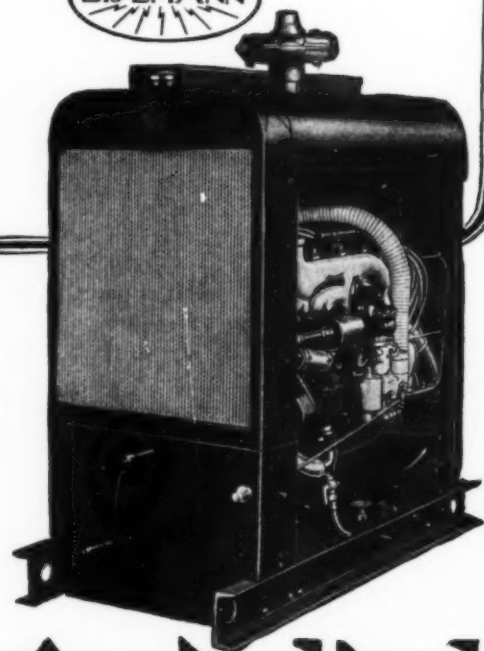
EISEMANN MAGNETO CORPORATION

165 Broadway, New York

DETROIT

SAN FRANCISCO

CHICAGO



# EISEMANN

## ELECTRICAL EQUIPMENT

# Why is a LINN essential to you?



You need tractors of some sort for that job and they must be unusually rugged. That still leaves a large field to pick from, you say. But consider the details!

1. The average tractor needs expert servicing. *A Linn is as simple to operate and maintain as any truck!*
2. Most tractors require a dead weight to obtain the necessary traction.

*Linns replace this with a pay load scientifically distributed over the chassis.*

3. A great many tractors by virtue of their construction cannot have the proper flexibility in the track element.

*Linns have probably the most flexible*

*track-laying type drive now in use!*

4. There are many tractors on the market but—

*Linns are used by leading contractors, counties, cities and industrial companies in this country and Canada.*

5. Road clearance is a feature which cannot be overlooked in tractor construction.

*Linn enigneers have amply provided for this factor by allowing a clearance of 18 in.*

*NOTE: We are carefully extending our representation and invite inquiries from responsible distributors of contractors equipment.*

## LINN MANUFACTURING CORPORATION MORRIS, N. Y.

New York Office—507 Fifth Avenue, Room 507—Murray Hill 5021, 5022  
Mussens, Ltd., Montreal—Canadian Distributors

**USE THIS COUPON**  
**LINN MANUFACTURING CORP.**  
**Morris, N. Y.**  
Gentlemen: Without obligating me in any way,  
please send me a copy of your Tractor Catalog.

Name .....  
Company .....  
Position .....  
Address .....

**1916 Tested Eleven Years in actual Service 1927**



## Even Kentucky muds are no haulage obstacle

Horses couldn't make this 20% grade through *river mud*. The job was material haulage at Index, Ky., for the North Fork Construction Company. Tractors supplied the motive power, but Watson 6-yd., all steel Tractor Wagons followed through with the goods. The ten inch tires on double disc

steel wheels successfully battled through.

Whenever materials must be hauled across marshy fields or roads it pays to investigate the performance record of the Watson All-steel Wagon. "First in the field, last in the repair shop, is the slogan.

### 3 Yd. Model

All steel construction, roller bearings, alemite lubrication, bottom dumping. Cut-under clearance at neck 18 inches. Bottom clearance, down—14 inches. In stock for immediate delivery.

*Don't wait until your mired  
to the hubs . . . Send for  
full particulars today!*

Watson Wagon Division  
REX-WATSON CORPORATION  
Canastota, N. Y.

### 6 Yd. Model

All steel construction, roller bearings, alemite lubrication, bottom dumping. Cut-under clearance at neck 18 inches. Bottom clearance, down—12 inches. In stock for immediate delivery.

# Watson <sup>All Steel</sup> Tractor Wagon



# backfill

with a  
**CATERPILLAR**  
REG. U.S. PAT. OFF.  
**TRACTOR**



#### PRICES

2-TON \$1850  
Peoria, Illinois

THIRTY \$3000  
Peoria or San Leandro

SIXTY \$5000  
Peoria or San Leandro

**THE BACKFILLER** replaces the shovel! Gasoline replaces sweat! Amazing are the reductions in the cost of filling ditches when the "Caterpillar" track-type tractor starts shoving earth in wholesale lots.

Gas and electric companies fill their ditches. Cities fill their sewers. Road makers fill in around bridge heads. Garbage is shoved over the dump. Oil companies fill in their pipe line trenches . . . .

Ask about the "Caterpillar" track-type tractor and the backfiller.

There is a "Caterpillar" Dealer near you.

**CATERPILLAR TRACTOR CO.**

*Executive Offices:* San Leandro, California, U. S. A.

*Sales Offices and Factories:*

Peoria, Illinois

San Leandro, California

*Distributing Warehouse:* Albany, N. Y.

*New York Office:* 50 Church Street

*Successor to*

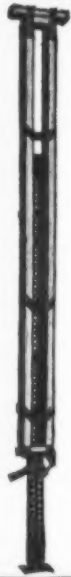
**BEST** C. L. Best  
Tractor Co.

The Holt Manufac-  
turing Company

**HOLT**

  
**better  
quicker  
cheaper**

# SURE-GRIP



## 10 SECOND ADJUSTABLE SHORES

THE ONLY AUTOMATIC, POSITIVE, PIN ADJUSTMENT SHORE, on the market. Cannot creep or settle under load.

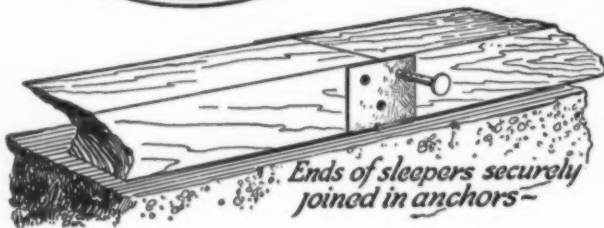
Entire shore, both wood and iron parts, painted to reduce depreciation.

Requires no loose tools of any description, for its operation.

Light weight (55 lbs.) guarantees ease in handling and speed in erection.



## SLEEPER & FURRING ANCHORS



*Ends of sleepers securely joined in anchors—*

SURE GRIP ANCHORS are made of Armco Ingot Iron, galvanized in addition with special-tight coat, making them rust-proof under all conditions.

Sufficiently wide to enable user to splice ends of sleeper in ONE grip.

Corrugated legs furnish positive anchorage and will not pull from concrete. (Tested to 1,200 lbs.)

Three sizes, 2, 3 or 4". Standard width 1 1/8".

**The Dayton Sure Grip & Shore Co.**

Dayton, Ohio

MAIL

TODAY!

SURE

GRIP



The Dayton Sure Grip & Shore Co.,  
Dayton, Ohio.

Gentlemen:

We are interested in Sure Grip Shores ☐, Sleeper and Furring Anchors ☐, Concrete Inserts ☐, Wall Ties and Spreaders ☐. Please mail us literature and prices.

Name.....

Address.....

HERE'S ANOTHER PATTERN

of the

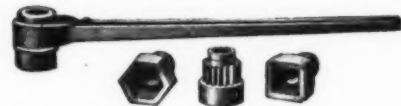
## LOWELL

### Reversible Ratchet Wrench

Another General Purpose Pattern

known as the

### STEEL SOCKET BRIDGE WRENCH



No.	Length of Handle Feet	Approx. Weight Pounds	FOR NUTS SHORT DIAMETER Square or Hexagon
1	2	10	1, 1 1/8, 1 1/4, 1 1/2,
1 1/2	3	12	1 5/8, 1 3/4, 2
2	3	23	2, 2 1/8, 2 3/8, 2 1/2,
2 1/2	4	26	2 3/4, 2 5/8, 3 1/8
3	3	50	3 1/2, 3 1/4, 3 3/8,
3 1/2	4	54	4 1/4, 4 5/8, 5

A CAPACITY RANGE from 5/8-in. to 3/4-in. bolt diameter offers a wide choice, with handles from 2 ft. to 4 ft. in length to meet your desires.

When a RATCHET WRENCH once grips a nut, its grip is continued until the job of turning the nut is completed.

It's the GRIP OF THE CHAMPION WRESTLER, which when once applied, has no let-up until the opponent's shoulders are on the mat.

It's a SURE GRIP, too, for the Socket or Gear of the Ratchet Wrench entirely surrounds the nuts. NO CHANCE TO SLIP. Your workman can pull as hard as he desires with no fear of injury.

You can shoot more bullets with a machine gun. You can turn more nuts with a Ratchet Wrench. Nero fiddled while Rome was burning. DON'T let your workmen "fiddle" away time, money and profits while engaged in turning nuts.

USE A RATCHET WRENCH

See that it's Reversible  
and a Lowell

**LOWELL WRENCH COMPANY**

54 Commercial Street

WORCESTER, MASS., U. S. A.

Write for CATALOG M.

# A Mouthful at Every Bite



**T**HOUGH Ages apart, the Triceratops and the Owen DX Extra Heavy Bucket both owe their biting power to the heavy body behind the jaws.

In the DX, as in all Owen Buckets, the weight is concentrated where it counteracts lifting and is utilized by the closing power to produce a tremendous push on the cutting edges of the jaws. This feature, combined with the fact that Owen design causes the jaws to sink in deep before closing power is applied, assures "A Mouthful at Every Bite."

There are seven types of Owen Buckets, each covering a broad field but better adapted to a different purpose. Write for descriptive literature.

**THE OWEN BUCKET CO.**  
6023 BREAKWATER AVENUE : CLEVELAND, OHIO

## Guarantee

Owen Buckets, properly installed and operated, are guaranteed to do a bigger day's work than any other bucket of the same weight and capacity—

—or—

Write your own guarantee!

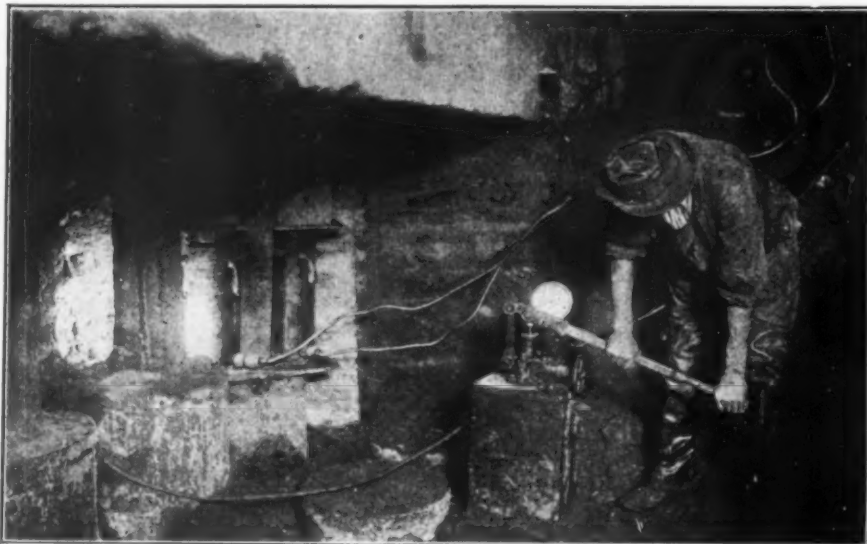
THE OWEN BUCKET CO.

*Could you ask for a broader, more comprehensive guarantee than the above? Owen performance has justified our confidence.*



# Owen Buckets





*Photo by courtesy of Spencer-White and Prentiss.*

## No Place Too Cramped for Watson-Stillman Independent Pump Jacks

They are being used extensively by Underpinning and Foundation Contractors for underpinning work, sinking piles under foundations and making tests of footings.

These jacks are accurate, dependable and easy to repair.

The pump, being independent, can be operated at a safe distance from the load and in a convenient position. For forcing and pressing work, it can be used in connection with your own framework. For extra heavy work, several jacks may be used with one pump or from an accumulator.

We make a full line of other types of jacks, and also many hydraulic devices suitable to the contractor's needs, such as benders, shears, pumps, punches, valves, etc.

*Write for catalogs.*

### THE WATSON-STILLMAN CO.

1014 Evening Post Bldg., New York City

Chicago, 549 W. Washington Blvd.

Philadelphia, Widener Bldg.

Cleveland, Auditorium Garage Bldg.

Detroit, 7752 Duboise St.

## 200 Ways to use

### FORD POWER

Don't miss the Ford Power Equipment Exposition at 1710 Broadway.

Two entire floors are devoted to a display of over 200 exhibits of industrial, agricultural and commercial units built to operate with the Fordson Tractor and Ford motor.

Nowhere else is it possible to see so many uses of power, to conveniently inspect all this up-to-date equipment.

Every user of power should see this exhibition.

*Descriptive Circular furnished gratis  
on any of these attachments.*

**POWER EQUIPMENT EXPOSITION**  
Ford Motor Building, 54th Street and Broadway, New York

The following are a few of the groups of equipment that can be seen on display:

Graders	Shop Trailers
Snow Plows	Agricultural
Locomotives	Implements
Lawn Mowers	Marine
Dump Trailers	Attachments
Tank Bodies	Air Compressors
Dump Bodies	Commercial
Road Rollers	Bodies
Street Sweepers	Cranes
Back Fillers	Hoists
Concrete Mixers	Pumps
Crawlers	Loaders
Stump Pullers	Shovels
Log Skidders	Wood Saws
Scoops	Saw Mills
Scrapers	Suburban Bodies
Tractor Trailers	Motor Boats

# Built on this Foundation



TRUCK CRANES

Universal Cranes are built on an unequalled bed rock foundation of Truck Crane experience.

The Universal Crane was the first crane designed primarily for motor truck mounting. It was designed in 1917 by men with over 30 years' crane building experience who saw the need for a speedy, portable crane in modern construction.

It has the benefit over 10 years of 100% truck crane building experience—it has the indorsement and accumulated experience of a tremendous number of Universals in all parts of the world, on all types of work, working under all conditions.

It has the experience behind it of shops devoted exclusively to truck cranes, of Engineers concentrating solely on truck cranes.

The Universal Crane Co. is the Oldest, Largest and Only Exclusive Builders of Truck Cranes, basing their policy on a single purpose—the maximum Speed, Reliability and Earning Power in Truck Cranes, backed by an unequalled wealth of Experience. Ask any Universal owner.

*Write for Bulletin 363 and additional facts on the Pioneer Universal Truck Crane.*

**The UNIVERSAL CRANE Co.**

970 Sweetland Bldg.

Cleveland, O.

*"Largest and Only Exclusive Builders of Truck Cranes"*





**SMALL MACHINES  
that do BIG WORK**

## PULLMCO Puller-Jacks

For Pulling, Moving  
Lifting and Placing

ALL STEEL      PORTABLE      COMPACT  
SIMPLE      DEPENDABLE

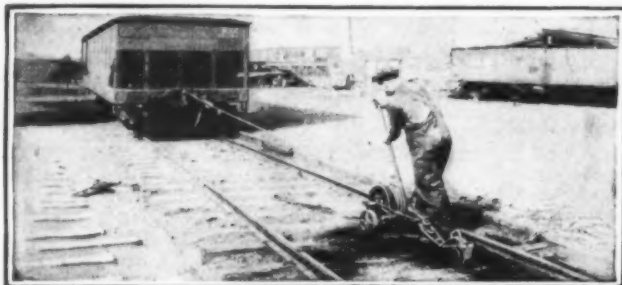
MODEL 1  
SIX SPEEDS  
\*CAP., 12 TONS

MODEL 2  
THREE SPEEDS  
\*CAP., 8 TONS

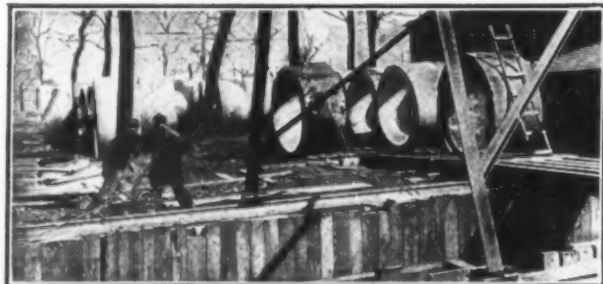
\*PULL ON A SINGLE CABLE

Puller Jacks are ready for use wherever there is anchorage to which a hook or a cable can be secured. They will work in any position and require less setting up and operating time, less man power and less tackle, than any other hand power pulling device.

Puller Jacks multiply the strength of one man 50 times. They are ideal tools for construction, wrecking, house moving, land clearing and material handling and many other purposes.



Car Spotting



Sewer Construction



Pulling Mixer Over Soft Ground

**RUSH THE JOB—NOT THE MAN!**

WRITE FOR ILLUSTRATED BOOKLET

**PULLER MANUFACTURING CO.**  
600 WEST 57TH ST., NEW YORK



## Deep Stuff!

This is a Cleveland "Forty-Four" operating in hard shale at the bottom of a storm sewer trench.

The quality of Cleveland Air Tools is "deep stuff" also—it goes all the way back to the design and is in-built with the high grade materials used in their construction. Quality has to be deep stuff. You will see what we mean when you operate Cleveland Air Tools and note how they have a habit of *staying on the job*.

Ask about Cleveland Sinkers, Paving Breakers, Clay Diggers, Backfill Tampers or Calking Tools. Bulletin 4463.

**The Cleveland Rock Drill Co.**  
3734 East 78th Street, Cleveland, Ohio

Chicago, Ill., 608 S. Dearborn St.  
Detroit, Mich., 428 Insurance Exchange Bldg.  
New York City, 30 Church St.  
St. Louis, Mo., 2091 Railway Exchange Bldg.

Philadelphia, Pa., The Bourse Bldg.  
Birmingham, Ala., 403 N. 24th St., Box 2028.  
Pittsburgh, Pa., 922 Farmers Bank Bldg.

Negaunee, Mich., 222 Heath St.  
British Representative: John MacDonald & Company, Pollokshaws, Glasgow, Scotland

# CLEVELAND ROCK DRILLS





## Excavating through 18 inches of frost

Digging sewer through 18 inches of frost at Greenbay and Hampton Roads, Wis. Owned by H. Teget, Milwaukee, Wis.

# Any Trencher without **THREE** bucket line speeds is obsolete

A trenching machine is nothing more or less than a cutting tool. When you are in hard digging you need LESS SPEED and MORE POWER. When you are in easy digging you need LESS POWER and MORE SPEED.

A trencher with only one bucket line speed is hardly ever satisfactory. It is either not fast enough or not powerful enough for the job at hand.

The P&H is the only large size trencher built with *Three Bucket Line Speeds Suitable for Every Condition of Digging.*

This is just another of the many reasons why the P&H digs at a *Lower Cost Per Foot Than Any Other Trencher Made.*

### HARNISCHFEGER CORPORATION

Trench Excavator Division  
Established in 1884

3894 National Avenue, Milwaukee, Wis.

New York	Chicago	Charlotte	Pittsburgh	Los Angeles	Atlanta
Philadelphia	Kansas City	Detroit	Portland	Seattle	Tampa
Birmingham	San Francisco	Dallas	Memphis	Jacksonville	Miami
Indianapolis		St. Louis		Minneapolis	

WAREHOUSES AND SERVICE STATIONS  
Philadelphia, Memphis, Jacksonville, San Francisco, Los Angeles, Seattle

### Speed Assuring Features

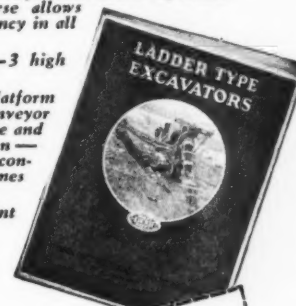
Powerful crowd when needed. Attachment is independent and may be disconnected when necessary.

Three Bucket Line Speeds without sprocket change and one reverse allows operation at full efficiency in all soils.

Corduroy traction—3 high traction speeds.

Dual control from platform on either side—spoil conveyor operating on either side and at any desired elevation—these features provide convenient control at all times by one operator.

Safety clutch at point of shock.



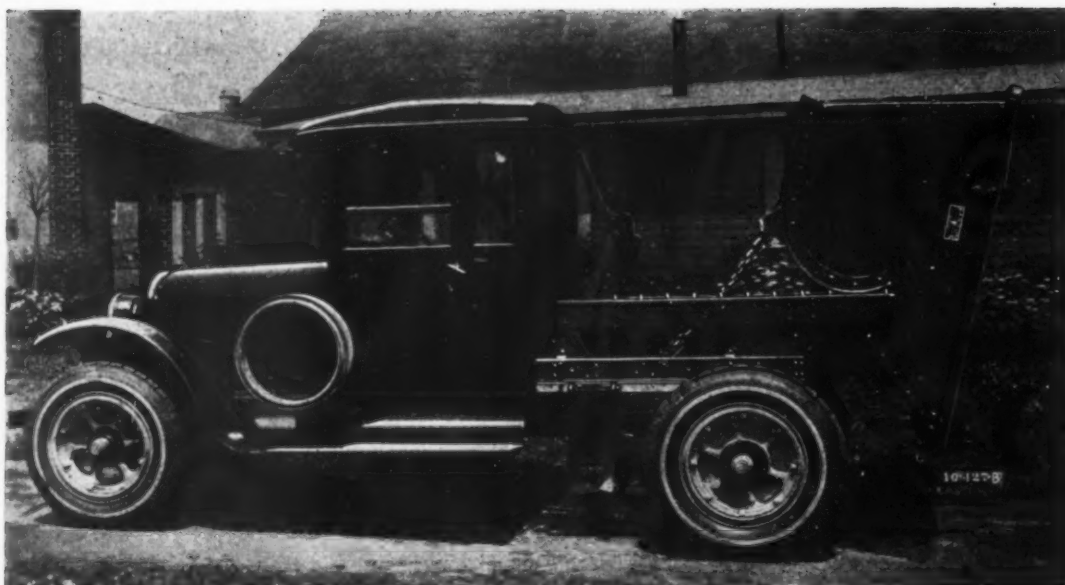
HARNISCHFEGER CORPORATION  
3894 National Ave., Milwaukee, Wis.  
Gentlemen: Please mail me a copy of the new  
Trencher Bulletin No. 19-X.

Name \_\_\_\_\_

Address \_\_\_\_\_

City and State \_\_\_\_\_

# P&H TRENCH EXCAVATORS



## Easton Roll- Over Bodies

IN SIZES  
from  
1 to 4 Yds.  
for  
TRUCKS  
or  
CARS ON RAILS

Dam builders, concrete mixing plants, clay mines, brick yards, general contractors and many others use EASTON ROLLOVER bodies because their easy automatic operating methods and *sixty degree* dumping angle save time and insure positive discharge of the stickiest material.

**Easton Car and Construction Co.**  
Easton, Penna.

# AUTO TRUCK DERRICK

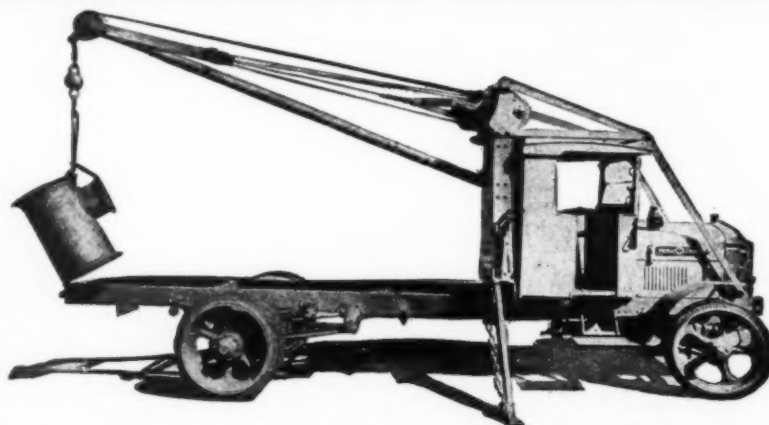
## HOISTS...LOADS... DIGS

**C**ONVERT your truck into a TIME and LABOR saver with this derrick. It will serve many purposes if mounted on a chassis of sufficient tonnage.

With HOOK or CHAINS, it lifts pipes, girders and other solid objects. With LAZY TONGS it handles barrels, bales, boxes, crates, etc. With CLAM SHELL or ORANGE PEEL bucket it loads stone, gravel, sand, coal and other soft or loose material.

ONE OPERATOR standing on truck has absolute control over the load and its placement.

The construction of this derrick is such that it can be knocked down, packed compactly and shipped anywhere. Derrick has large factor of safety over specified capacity. Protection from breakage due to overload is insured by



patented slipping clutch set to lift slightly in excess of rated capacity.

Operation of clam or orange peel bucket is simple, any unskilled workman can operate this machine and it will also do the work of vertical hoists on trucks for raising and lowering body.

Prices and fuller details will be sent on request. Certain territory still available for first class Distributors. Correspondence invited.

**ATIA CORPORATION, 150 Broadway, New York, U.S.A.**

Also ATIA Ash and Garbage Removal Bodies

# Here, There, Anywhere

**L**OADING hard packed sand from pit into trucks in less time than it formerly took from 20 to 30 men to do it, it is only one of a thousand uses for the **BROWNING Truck Crane**.

Use it for excavating, digging trenches, laying pipe, grading, handling lumber, loading and unloading every kind of material with bucket, dragline, magnet or hook and it will make money for you.

And remember! A **BROWNING Truck Crane** can go anywhere that a truck can.

## **THE BROWNING CRANE COMPANY**

16226 Waterloo Rd.

**CLEVELAND, OHIO, U. S. A.**

**NEW YORK**

**CHICAGO**

**PITTSBURGH**

**BIRMINGHAM**

*Sales Agents:*

Philadelphia Portland Los Angeles San Francisco Montreal

Toronto London, England

# **BROWNING**



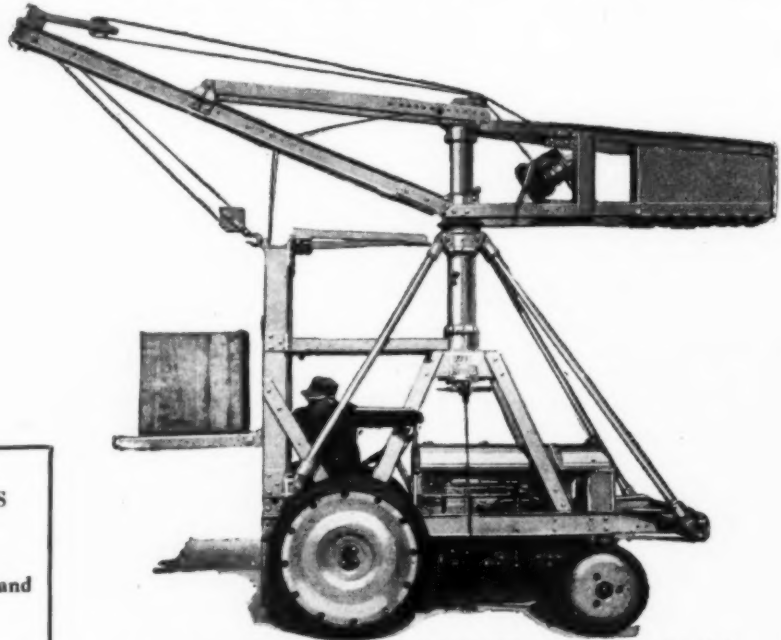


## CONSTRUCTION SHORT CUTS *by Efficient Handling*

You can speed construction, reduce your investment in handling equipment and use less labor.

This compact, inexpensive crane does the work—and does it better—than cumbersome units. The Otis Revolving Hammerhead Crane is ideal for hoisting, piling, carrying, loading, unloading, tiering and a host of other handling operations.

*Write today for further information. Our engineers are at your service for any specialized problem.*



OTIS REVOLVING HAMMERHEAD CRANE with rear elevator platform. Standard equipment includes crane with elevator or lift platform in rear.

### FEATURES

Full Circle Crane—  
Swings 18-ft. circle,  
Lifts 15-ft.  
1-ton Carrying Capacity.  
Elevator Platform in  
rear.  
10 miles per hour speed.

### POSSIBLE ATTACHMENTS

Rotary Boom  
Trench Backfiller.  
Lumber Carrier and  
Piler.  
Trailers.  
Generator, Pump or  
Compressor.

## OTIS ENGINE CORPORATION

247 Park Avenue

NEW YORK CITY

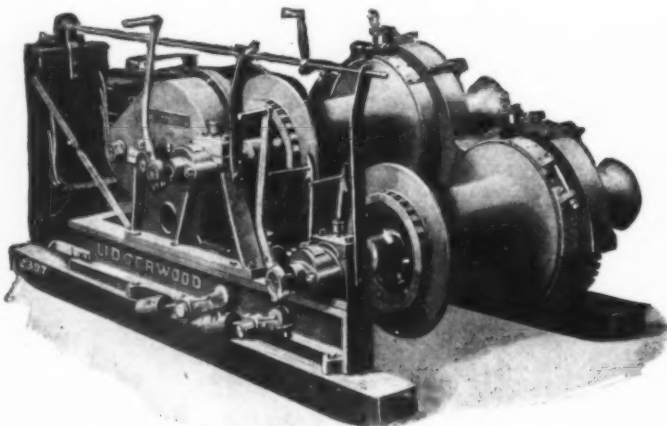


Illustration shows a new Lidgerwood design for high speed derrick work



## ELECTRIC—GASOLINE STEAM—BELT HOISTS

Every size and style used  
on contracting work

*Save Waiting Time  
Idle Labor Cuts Profits*

*A Time Saver and a Profit Maker*

CABLEWAYS

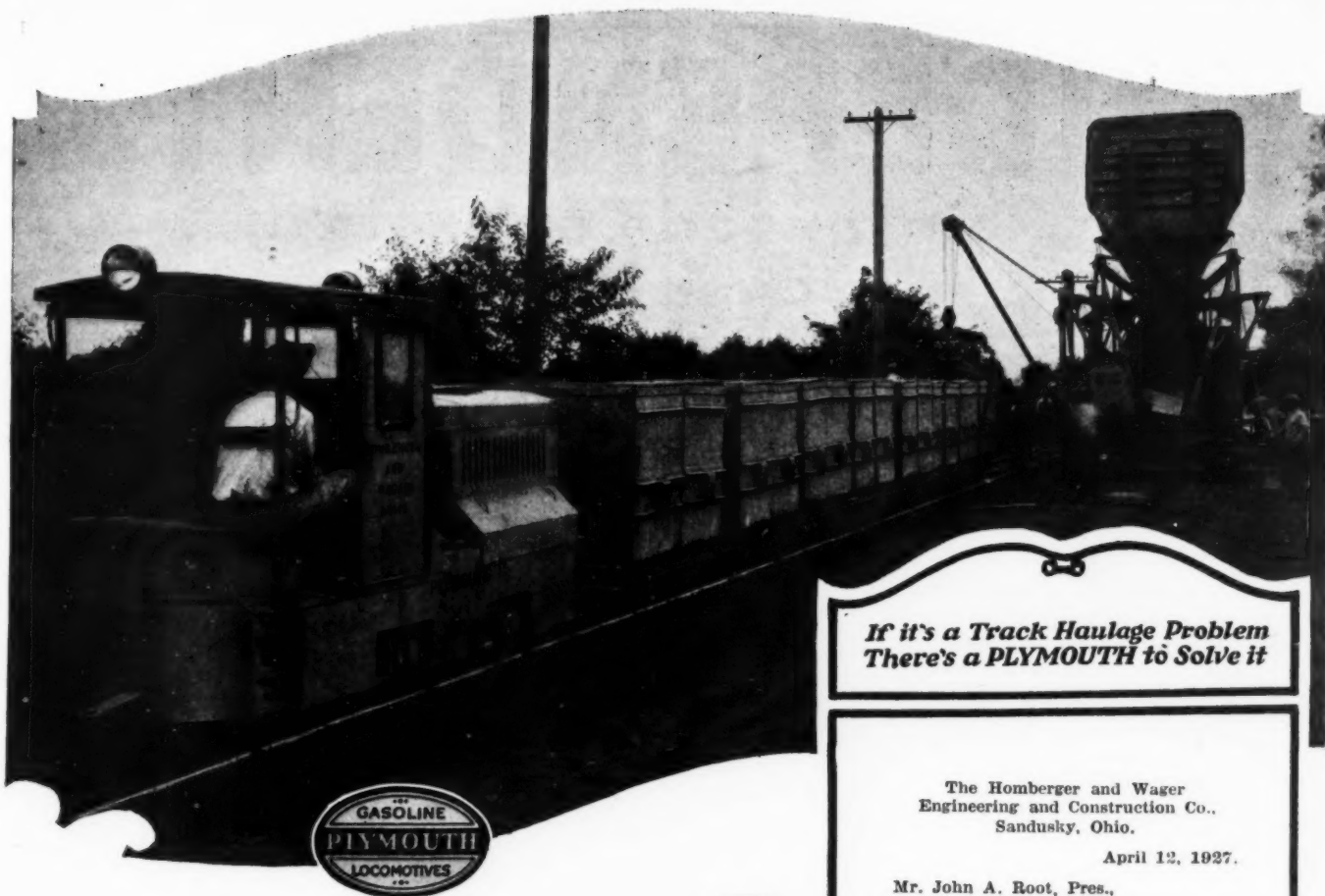
HOISTS

DERRICKS

## LIDGERWOOD MANUFACTURING COMPANY

96 Liberty Street, New York, N. Y.

Chicago Pittsburgh Philadelphia Columbus, O. Seattle Portland, Ore. Jacksonville, Fla. Birmingham, Ala.  
Sales Agents: Lidgerwood Pacific Co., Tacoma; Robert S. Smilie & Co., San Francisco; Woodward Wight & Co., New Orleans; John D.  
Westbrook, Inc., Norfolk, Va.; Cameron & Barkley Co., Charleston, S. C.; Riechman Crosby Co., Memphis, Tenn.; F. C. Richmond  
Machy, Co., Salt Lake City, Utah; H. H. Meyer Co., Baltimore, Md.; Washington, D. C.; Garlinghouse Bros., Inc.,  
Los Angeles, Cal.  
Foreign Offices: London, England; Sao Paulo, Brazil; Canadian Allis-Chalmers, Ltd., Toronto, Canada.



## ARE YOU SURE? of getting Cement and Aggregate to the Mixer EVERY DAY?

In what condition is the old road? What kind of going will it be in wet weather if you depend on trucks for haulage? Are you gambling on a dry season?

Plymouths and track haulage will assure you a "dry season profit" instead of a "wet season loss." Why take the chance when there's a sure way? The question to decide is "mud versus steel rails," the initial cost is practically the same and you won't rack a Plymouth on one job either.

**PLYMOUTH LOCOMOTIVE WORKS**  
*The Fate-Root-Heath Company*  
PLYMOUTH, OHIO

**PLYMOUTH**  
*Gasoline Locomotives*

***If it's a Track Haulage Problem  
There's a PLYMOUTH to Solve it***

The Homberger and Wager  
Engineering and Construction Co.,  
Sandusky, Ohio.

April 12, 1927.

Mr. John A. Root, Pres.,  
The Fate-Root-Heath Co.,  
Plymouth, Ohio.

Dear Mr. Root:

We have found our Plymouth locomotives to perform perfectly in every respect.

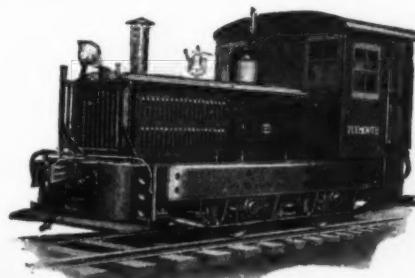
Notwithstanding the fact that we had from 4 to 6% grades, we hauled a train of eight cars, two batches to the car, weighing five tons to the car, making a total of 40 tons to the train, feeding a 27-E Mixer.

The operators and superintendents on the jobs have nothing but words of praise for the efficiency and operation of these locomotives.

Very truly yours,

The Homberger & Wager Eng. & Const.  
Co.

John A. Weichel,  
Sec'y-Treas.



The PLYMOUTH 25-TON GASOLINE LOCOMOTIVE is specially built for heavy hauling and shifting.

# INDEPENDENT

## Reinforced Concrete Sewer Pipe

### Backed by SERVICE



Building INDEPENDENT Concrete  
Sewer Pipe in a central yard.



Delivering 96-inch Concrete Sewer Pipe  
from yard to trench.

When "INDEPENDENT" supplies the pipe for a concrete sewer, the contractor gets the kind of material and service that mean a more profitable job for him, and a more permanent sewer for the community.

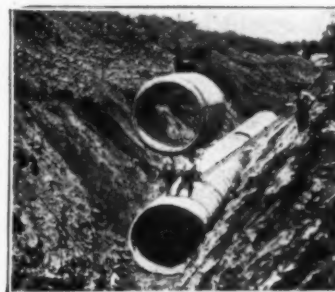
He gets his pipe promptly—pipe are manufactured in a special plant on the job, or near by and delivered ready to lay. He gets highest quality pipe, backed by the largest exclusive builder of reinforced concrete sewer pipe. He gets pipe that are easier to lay—the "Recessed Joint" saves time, labor and money, and makes a better job.

Get our quotations on your prospective concrete sewer jobs. Write, wire or phone (Main 2131).

INDEPENDENT CONCRETE PIPE CO.  
209 N. West St., Indianapolis, Ind.  
Sales Agencies in Principal Cities



INDEPENDENT Concrete Pipe  
delivered to the site of a sewer.



Laying a line of INDEPENDENT  
84-inch Concrete Sewer Pipe.



**Do the job  
with  
Metaforms  
save time  
and labor—  
cut costs**



**METAL FORMS CORPORATION**  
Milwaukee, Wis.



Name those things which you want your paver to give you. Check the New Rex 27-E against them. On this buying basis you will buy the Rex—"The Finest, Fastest Paver ever Built." Ask for a catalogue on it.

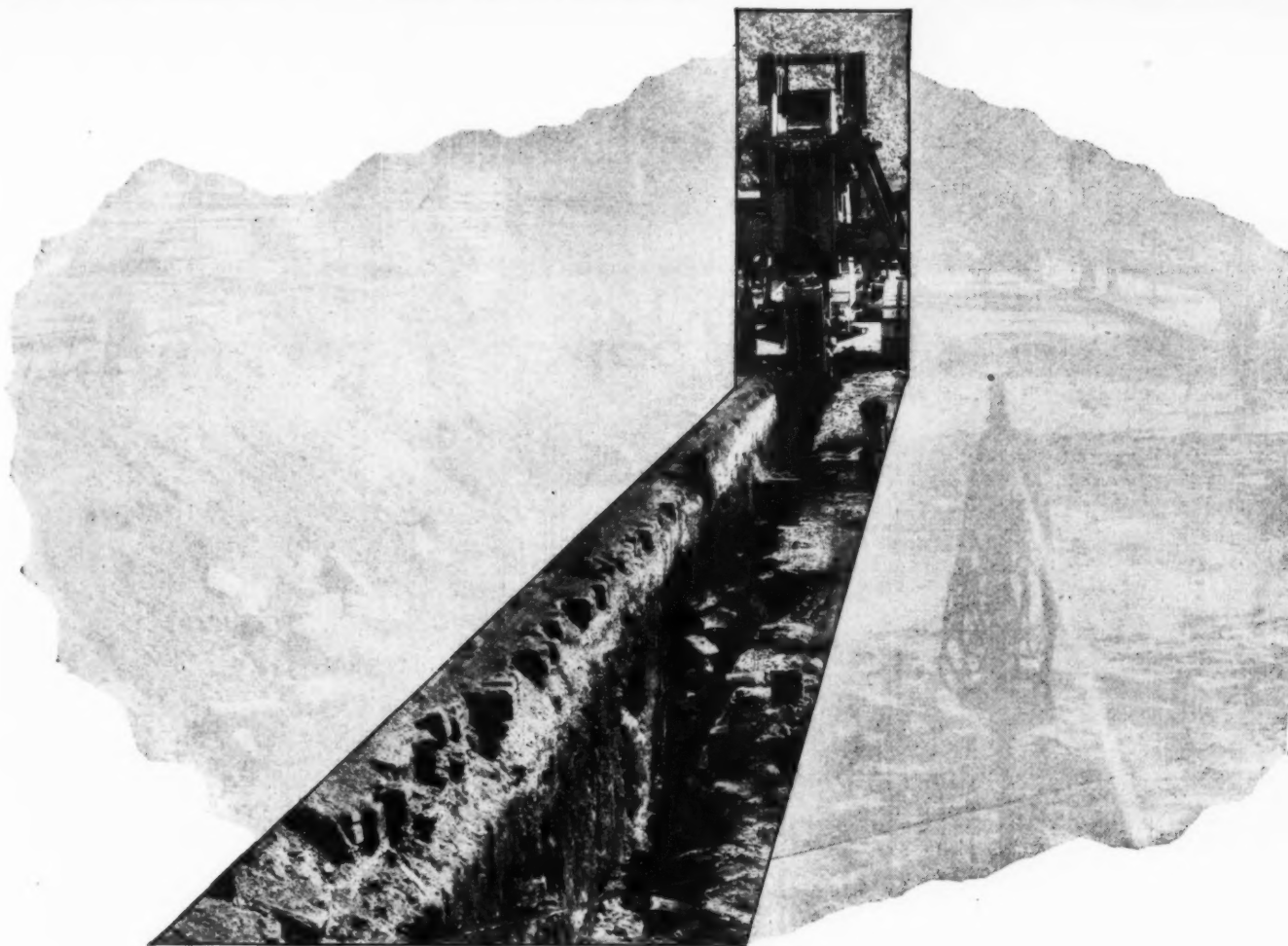
CHAIN BELT COMPANY, 264 Park Street, Milwaukee

**REX PAVERS**

(Reg. U. S. Pat. Off.)



ONLY THE BARBER-GREENE HAS THE VERTICAL DIGGING BOOM AND THE OVERLOAD RELEASE



## Straight Down a Brick-Paved Street

**H**ERE'S some tough going—straight down a brick-paved street in Johnstown, Pa. Only the Barber-Greene's vertical boom could make such phenomenal digging possible.

It digs straight down in the shortest possible line. It provides the famous "milling action" that cuts through such stuff as coral rock and solidly frozen ground. It makes the Barber-Greene fast enough to tear off a mile a day on oil field pipe lines.

And it is one of the biggest reasons why Barber-Greene's sales records are making history in the ditcher field.

*From cover to cover, this book is packed full of pictures and cost records that are worth a lot to anyone interested in cutting ditching costs. Its name is "Ditching Snapshots and Records." A post card will bring you a copy by return mail. Send today.*



BARBER-GREENE COMPANY, 530 W. PARK AVE., AURORA, ILLINOIS



## Barber-Greene Ditcher

*Representatives in 50 Cities*

DISC FEED LOADERS

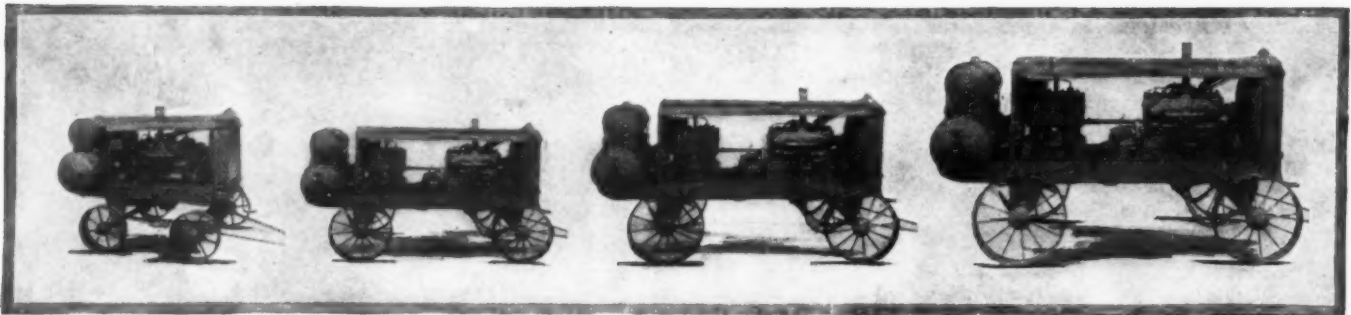
VERTICAL BOOM DITCHERS

STANDARDIZED PORTABLE AND PERMANENT BELT CONVEYORS

SNOW LOADERS

CAR UNLOADERS

COAL LOADERS



60 cu.ft.

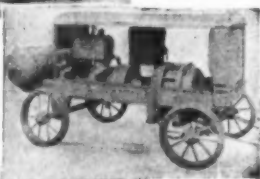
120 cu.ft.

180 cu.ft.

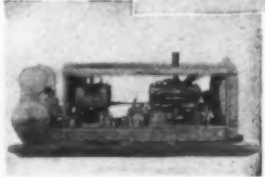
240 cu.ft.



For Truck Mounting



Direct - connected Motor Drive



For Semi-Portable or Stationary Installation.

## STEPPING THEM UP—

Built in four sizes with displacements of 60, 120, 180 and 240 cubic feet, "SCHRAMM" multi-cylinder engine driven compressors cover all requirements of the field.

SCHRAMM, INC., *Manufacturers*  
West Chester, Pa.

*Offices and representatives in all important cities*

# SCHRAMM

# Buhl

AIR COMPRESSORS

Below is illustrated the BUHL Type C Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

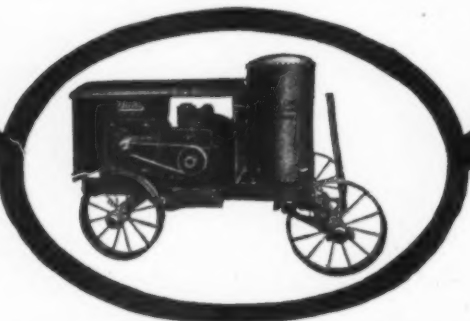
There are six sizes of portable air compressors in the BUHL line to choose from. For operating jack hammers, riveters, clay spades, concrete breakers, etc. The BUHL gives dependable air power at low cost—send for bulletins today.

Sales offices in principal cities

**THE BUHL COMPANY**

*Manufacturers*

37 W. Van Buren St., CHICAGO



## That's the way to do it!

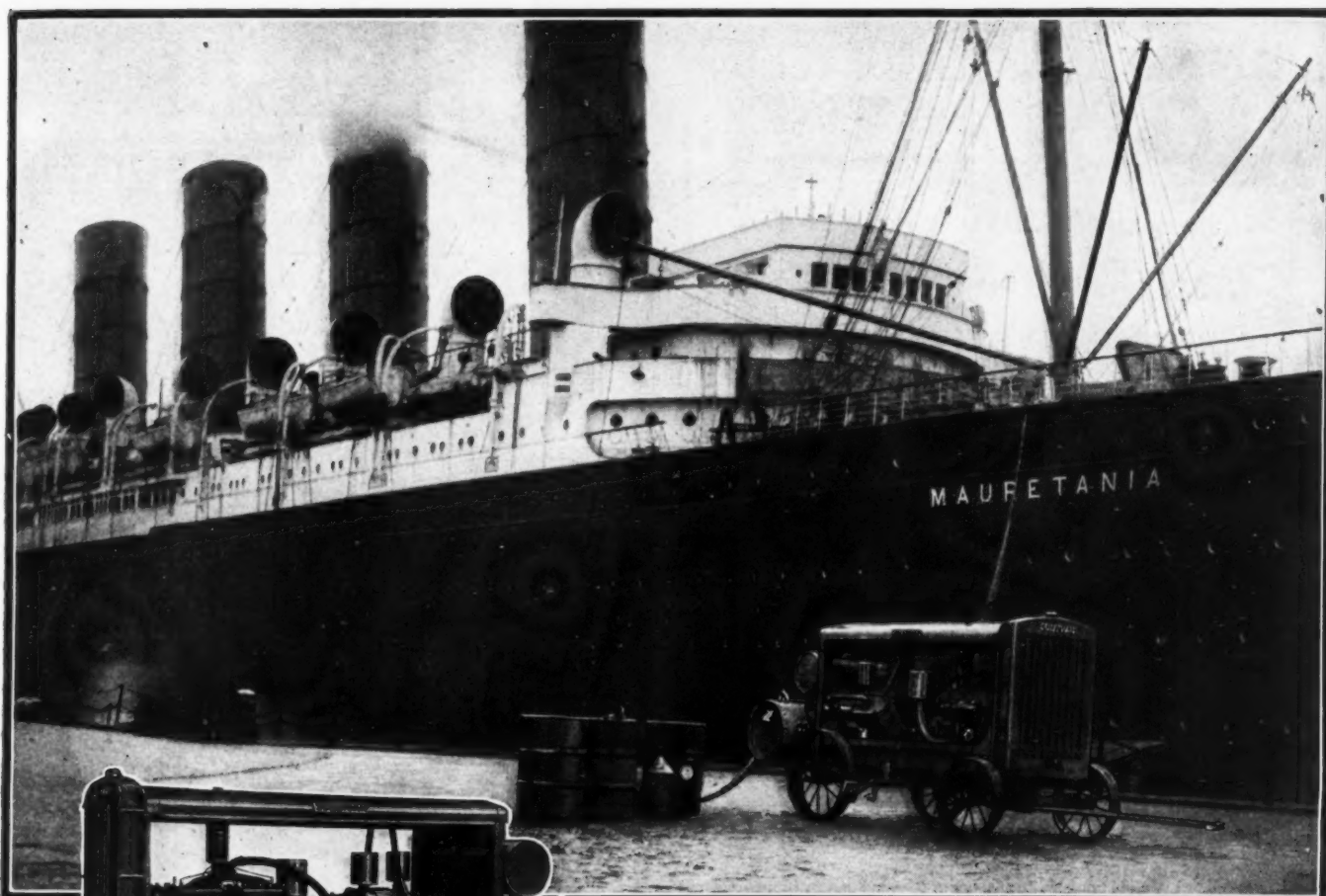
UNION-PILE-HAMMERS  
DRIVE  
AND  
PULL

Driving wood sheeting with a Union No. 8 beats hand-driving 57 ways. Try this lightweight, hard-hitting Hammer and see if it doesn't.

There are 9 husky members of the Union Hammer family—covering all pile driving requirements. Investigate the line!



**UNION IRON WORKS, Inc.**  
Monroe and Grove Sts.,  
Hoboken, N. J.



"WK-314," 320-ft. "V" Type 4-Cylinder Compressor

## Even Seconds Cost Money

**D**ELAY costs the famous Cunarder "Mauretania" nearly \$1100 per day for interest charges alone (at 5%).

So last winter, when being overhauled at Liverpool, a Sullivan Portable Air Compressor was purchased as the best insurance against interruption of the vital air supply.

The machine furnished air for metal drills, riveters, etc., in making structural alterations.

### Dependable Air Power Service

A non-stop run, day and night, for 46 hours, was the introduction of this 310 foot, Sullivan "V" type, balanced compressor to the job. The machine ran at full load continuously, without stress or undue heating, and gave perfect satisfaction throughout the repair work on S. S. Mauretania. Its compactness,

smooth running and freedom from vibration pleased the owners particularly.

This is but one example of the reliable, continuous service which Sullivan Portable Compressors are giving their owners, in road building, street repairs, building construction, mining, and in many other industrial fields.

Sullivan Portable Compressors may be had in Buda powered gasoline engine units of 110, 160, 220 or 310 cu.ft. capacity; and with electric motor drive in 103 and 306 foot sizes. They may be mounted on skids, steel wheels or trailer trucks. Larger sizes have 4-cylinder V-type compressors, exceptionally smooth running.

*Ask for Bulletin No. 483-D.*

*Sullivan Rotator Drills, Concrete Breakers, Clay Spaders, Portable Hoists are also at your service. Bulletins on request.*

# SULLIVAN MACHINERY COMPANY

168 SOUTH MICHIGAN AVE.

CHICAGO, ILLINOIS, U. S. A.

New York  
Boston

Pittsburgh  
Cleveland

Knoxville  
St. Louis

Denver  
Dallas



Salt Lake City  
El Paso

Duluth  
Spokane

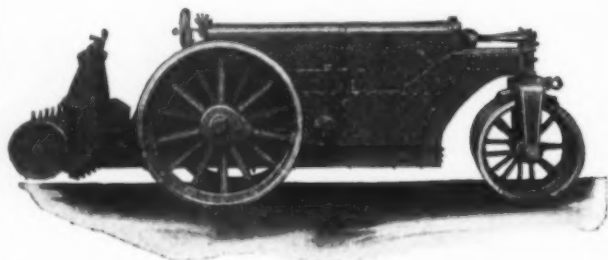
San Francisco  
Los Angeles



# BUFFALO-SPRINGFIELD ROLLERS

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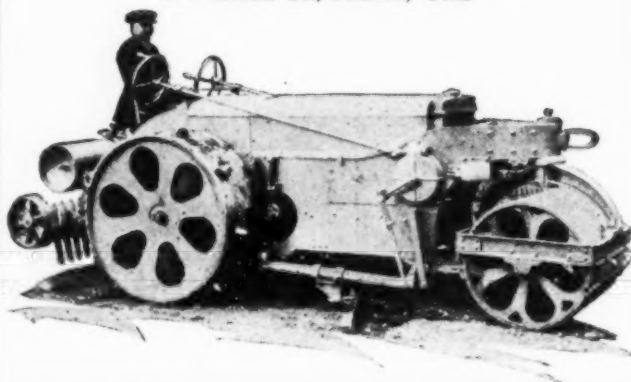
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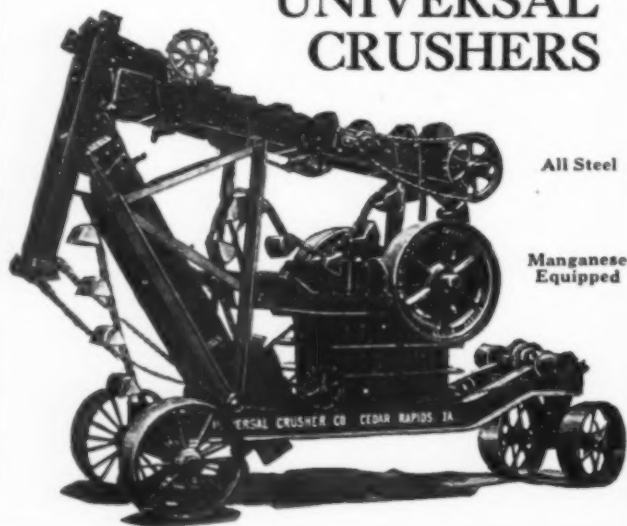
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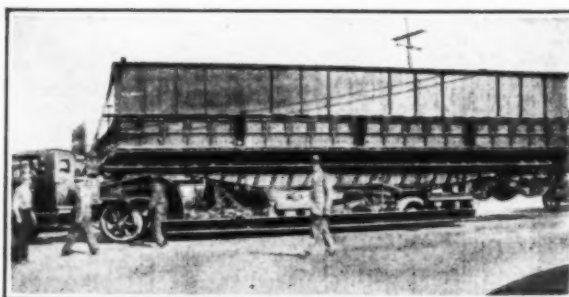
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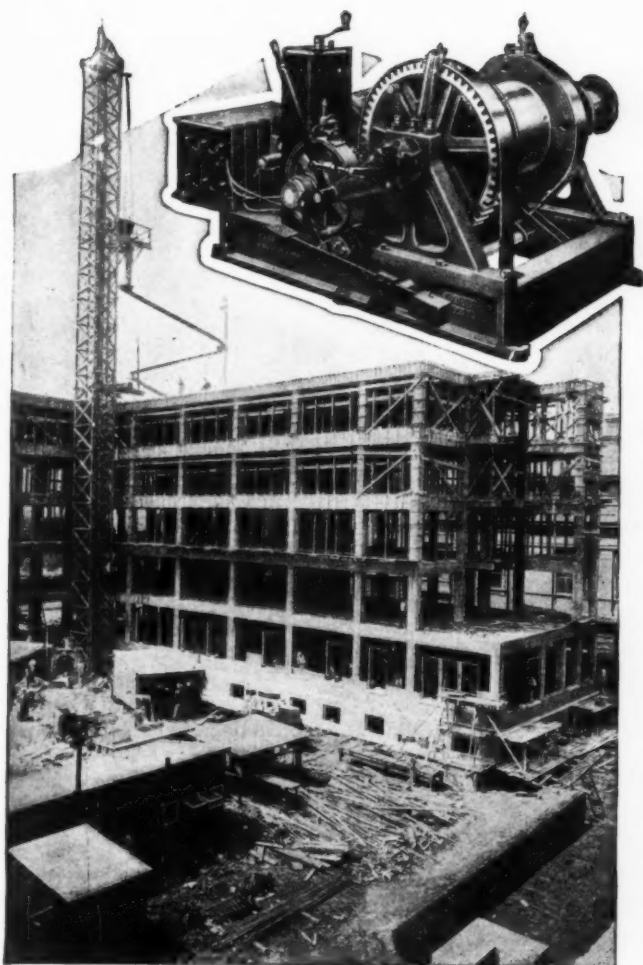
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SULKY DERRICKS—DERRICK FITTINGS





# HOISTS CLYDE DERRICKS



An extremely effective Clyde unit is the single drum electric concrete tower hoist shown in the illustration. It is used here on the new maternity hospital of the Barnes Hospital Group at Euclid and Kingshighway, St. Louis.

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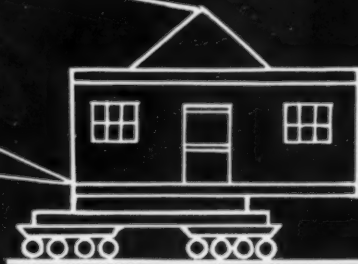


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60' to 100' Boom

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P & A Photo

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The diaphragm models are built for a total head of 50 ft. The 4-in. double type handles 17,500 G.P.H.

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## HUMDINGER PUMPS

## To make your unwatering and water supply problems easier!



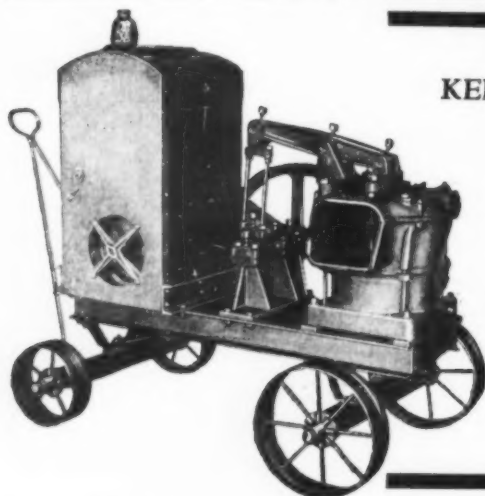
THIS Morris Portable All-Purpose Pump handles anything from clear water to floating dirt, sand and gravel, delivers 300 to 600 gals. per min., can be used for heads up to 50 ft., and is easy to cart from one job to another. For general water supply, unwatering excavations, sumps, etc., it can't be beat.

*Write for literature about this and other sizes  
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## CENTRIFUGAL PUMPS



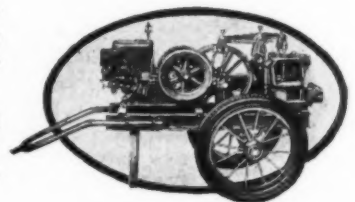
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# Are you a Progressive Buyer?

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NO SINGLE CAUSE has brought this about, but one factor that has had as much to do with it as any is cited by Ida M. Tarbell in her "Life of Elbert H. Gary." In picturing the beginnings of the steel industry she refers to the early Western settlers in the following terms:

*"These settlers were progressive buyers. That is, they were open to new tools, asking nothing better than to spend money for that which enabled them to do their work more quickly."*

AS WITH AMERICAN INDUSTRY in general, so with Civil Engineering and Construction in particular. Behind the astonishing progress of the American constructor is the spirit of *progressive buying*—a willingness to invest capital freely for equipment and materials that enable the doing of work better, faster and cheaper.

THIS, TOO, is the faith that has inspired the manufacturers of construction tools and materials to devote their capital and their energies

to meet the needs of the progressive buyers—to provide them the wherewithal to carry on their vast undertakings more successfully and more profitably.

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TAKE ADVANTAGE, therefore, of the services offered you by the paper and by the manufacturers whose stories appear in these pages. The successful field man of today must be a *progressive buyer*. But he must be more than this—he must be an intelligent and discriminating buyer as well. This he can be most surely and conveniently if he will keep abreast of the development of his craft as reflected in the manufacturers' presentation of modern equipment, tools and materials.

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## Construction Methods

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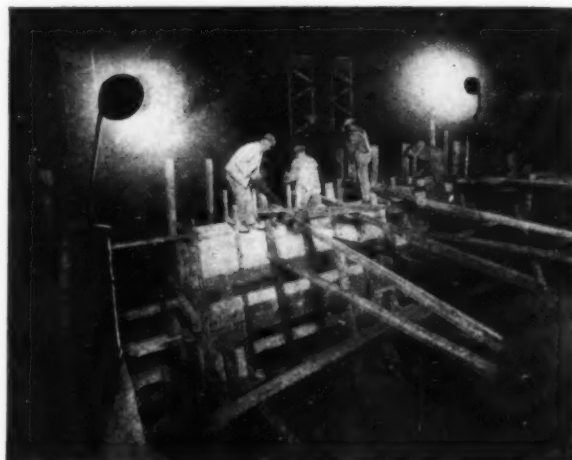
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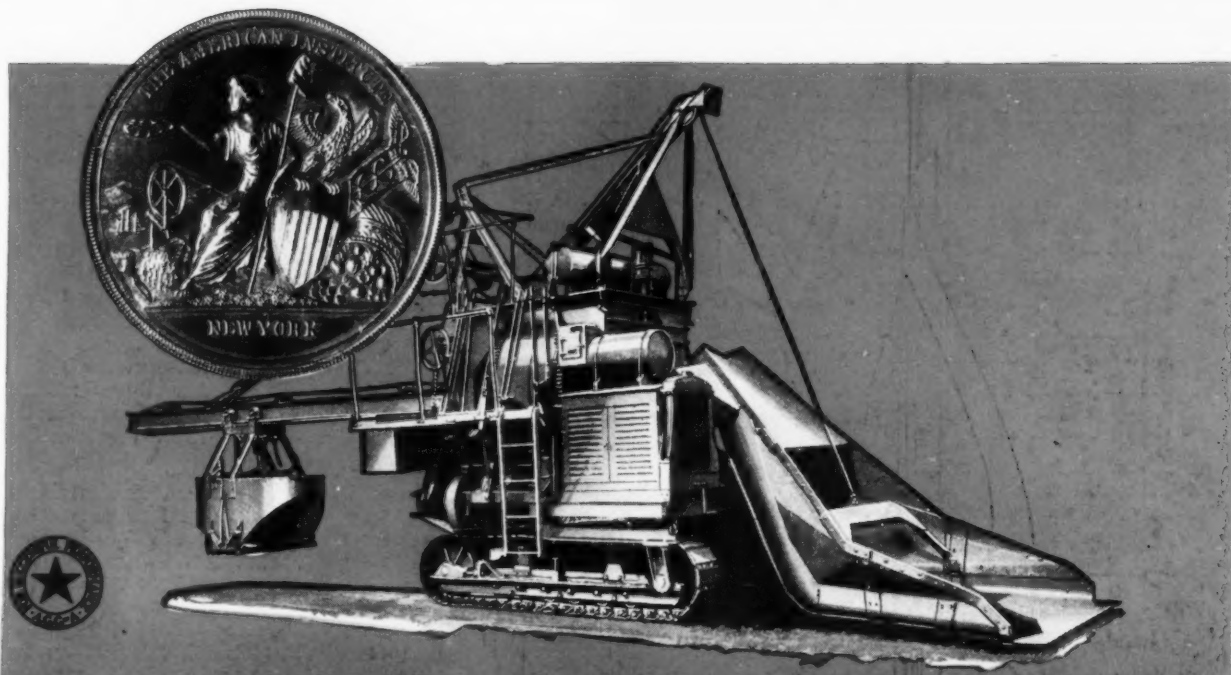
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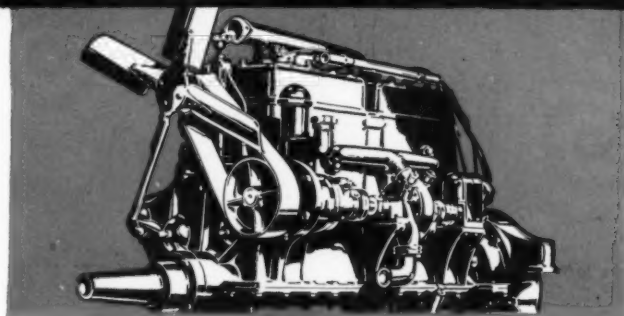
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